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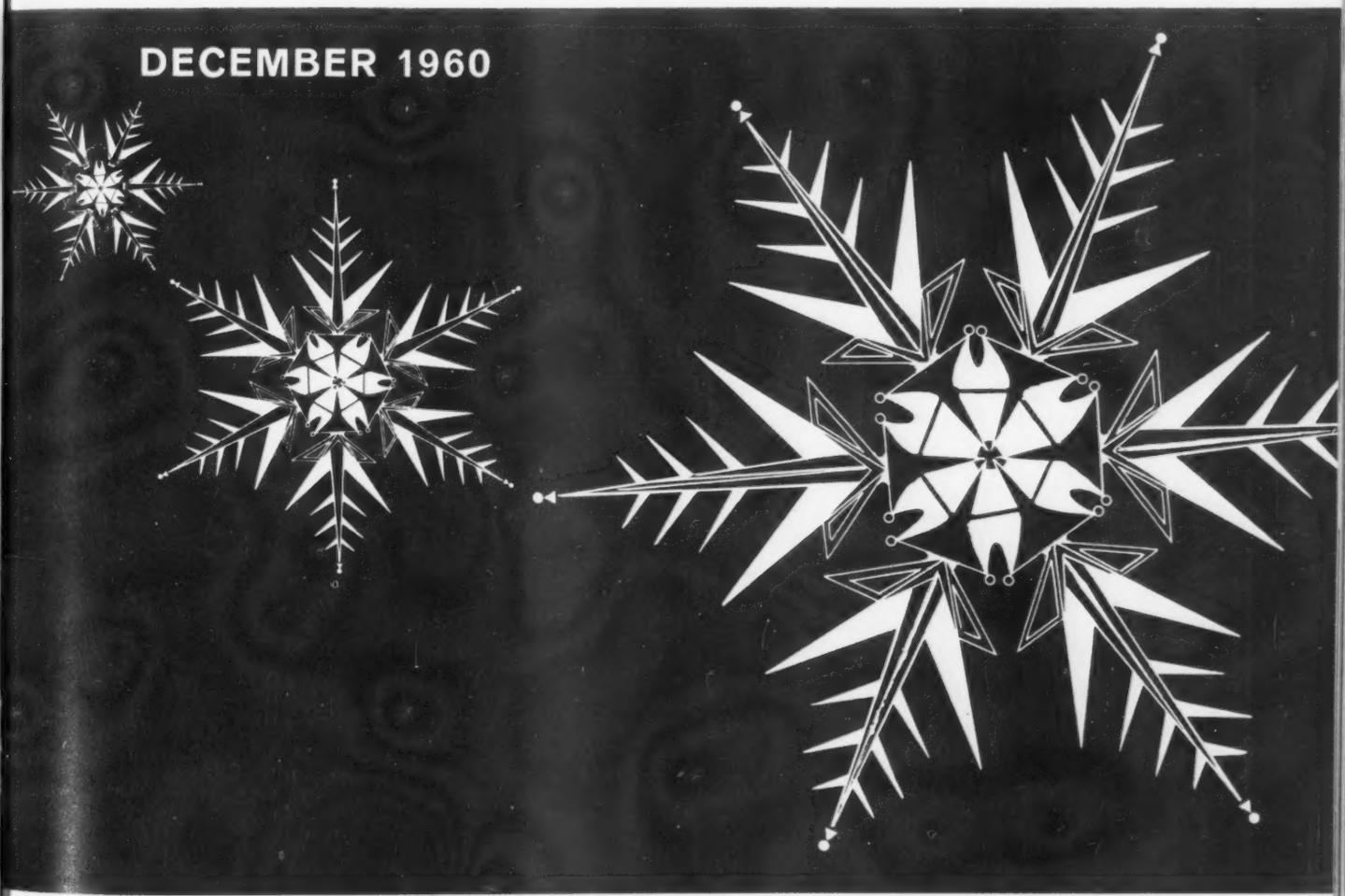
Gas Journal
THE MAGAZINE OF GAS DISTRIBUTION

DECEMBER 1960



How To Design Low Pressure Gas Piping

UNEQUALLED IN ITS CLASS

RELIANCE SERIES 1200

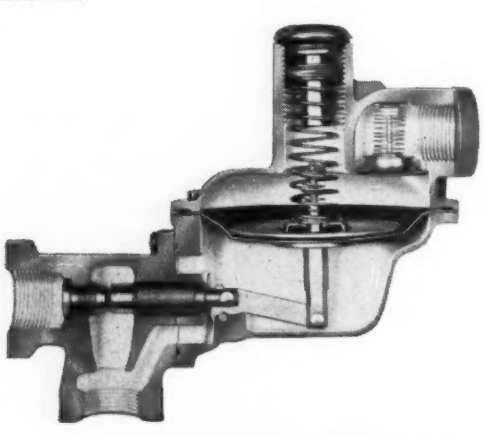
DOMESTIC SERVICE REGULATOR

Developed specifically for house service installations, the economical Series 1200 four-inch diaphragm class regulators provide many *exclusive* quality features with field-proven, dependable performance. Series 1200 Reliance regulators provide the most advanced design for those companies whose systems lend themselves to use of small regulators for compact meter settings.

Capacity of the 1200 Series is 270 cfh at 2 psi inlet, $\frac{5}{16}$-inch orifice and 1-inch w.c. pressure drop, with correspondingly higher capacities for other inlet pressures and orifices. Suitable for inlet pressures to 125 psi and outlet pressures from 5- to 15-inches w.c. Manufactured to conform to A.S.A. Code requirements.

Two models are available . . . standard Model 1203 and *full capacity internal relief* Model 1213B. Both models are also provided as Series 1300 regulators with *detachable* meter bar for 6- or 11¼-inch connection centers.

See Bulletin 105 for complete details and specifications.



CHECK THESE EXCLUSIVE FEATURES!

- RUGGED CAST IRON PIPE SECTION provides maximum strength — prevents thread galling.
- POSITIVE LOCKUP — gives over 20% greater available lockup power than any comparable regulator of its class — provides greater safety factor in event of foreign matter on valve seat.
- REMOVABLE DIAPHRAGM SECTION for ease of servicing without disturbing piping connections — valve seat disc easily replaced.
- TWO-PIECE CONSTRUCTION permits choice of four valve head positions.
- ADJUSTABLE RELIEF VALVE for accurate setting of any desired relief pressure.
- DETACHABLE METER BAR models available for both 6- and 11¼-inch connection centers.

CHECK THESE QUALITY FEATURES!

- Compact design reduces meter set assembly costs — elbow-type cast iron head simplifies piping connections.
- Relief valve stop assures relief valve operation under the most severe conditions.
- Extra-large ¾-inch weatherproof screened vent provided in four basic positions.
- Die-cast aluminum alloy body and top for ease in handling, shipping and setting.
- Brass orifice easily changed through inlet connection.
- 125 psi maximum inlet pressure. Springs available for outlet pressures from 5- to 15-inches w.c. Body sizes ¾- and 1-inch. Orifice sizes ⅛-, $\frac{3}{16}$-, ¼-, and $\frac{5}{16}$-inches.

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PILOT..
..LIGHTS

Gas Lights and Caroleers

Christmas, 1960, will be an even merrier season for many groups of caroleers around our nation, thanks to the revival of the gas light. Once again, the merry songsters can gather around the gas lights in front of many thousands of homes, . . . gas lights gaily bedecked with a bright ribbon . . . and sing the familiar Christmas carols. All of which goes to prove that gas lights . . . and all the wonderful things that gas can do . . . our formidable part of our heritage.

To all our many thousands of readers, we of American Gas Journal join together to wish you and yours . . . *"A Very Merry Christmas!"*

The Price of Gas

Needed: A way to stabilize the price of gas to consumers while providing producers with adequate economic incentives to find new reserves, and simultaneously allow pipeline companies to earn a reasonable and just rate of return.

Found: In this issue, a summary report on what natural gas' three segments — producers, pipeliners, and distribution companies — believe are chief among the industry's current problems re gas prices . . . field, city gate, and burner tip. No clear-cut answer is yet available, but the outlook for harmony among the three groups grow brighter and brighter.

$\sqrt{3.6987568?1/3245?Ax=By?}$

Looking for an easier way to solve those difficult math problems? You might, if you are inclined to use short cuts, "Use the Gears Between Your Ears, or, LAY THAT SLIDE RULE DOWN!"

That's the title of a provocative four-part series that begins in the January issue, in which Prof. Paul Grogan, chairman of the Engineering Department, University of Wisconsin Extension Division, takes the mystery out of mathematics.

Don't be a rounder . . . mark your calendar now to carefully read chapter one, appropriately entitled "Fun With Squares."

Energy and Western Europe

In January, consulting editor Joseph Kornfeld reports on developments in Western Europe's changing energy picture . . . the introduction to reports on gas distribution and related activities throughout the dynamic, growing common market area.

American Gas Journal

ONLY MAGAZINE EDITED EXCLUSIVELY FOR THE GAS DISTRIBUTION INDUSTRY

Volume 187 December 1960 Number 13

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Massive malleable iron construction. Hinged on one side. Single oversized plated bolt. Simplicity itself. Full contour contact—can't crush.

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M C F

NEWS HILITES OF THE INDUSTRY

Area prices set by FPC don't apply to the pending CATCO case, the commission has stated. The case involves the price of offshore Louisiana gas sales by the CATCO group of independent producers to Tennessee Gas Transmission Company. The CATCO case is currently before the FPC on remand from the U. S. Supreme Court. Hearings began last March 15 to permit producers to present evidence to support their proposed initial price of 21.4 cents per Mcf, in accordance with the Supreme Court ruling. The FPC area pricing policy statement of September 28 was amended on October 25, when the commission set area natural gas prices of 20.96 cents per Mcf for initial sales from southern Louisiana and the state of Mississippi. The earlier statement set a price of 13.7 cents per Mcf for existing contracts in the same area.

Import of natural gas from Canada on an interruptible basis at Niagara Falls, New York, by Tennessee Gas Transmission Company, denied in an initial decision by Examiner Harry W. Frazee last September 23, will be subject of hearings opening December 19 in Washington. Tennessee requested in October that it be allowed to submit additional evidence supporting its application. It proposes to receive up to 204,000,000 cu ft daily on an "as, if, and when available" basis from Trans-Canada Pipe Lines.

Role of gas in the home building industry is given royal treatment in the October 1960 issue of HOUSE & HOME. The homebuilding industry publication joined A.G.A. and GAMA in sponsoring an industry round table on "*The Use of Gas in Tomorrow's Home*" that resulted in a 9-page report, supplemented by a 17-page report on "*How Gas Utilities Help Builders Sell.*" Both reports, plus a big 34-page Blue Star Home ad section are available in a special 62-page reprint.

How long is an inch? While not of great importance to the man in the street . . . or the serviceman measuring a short section of pipe to install a new gas range . . . you should know that the inch is now equal to 41,929.399 wavelengths of krypton light. On October 14, 1960, at 6:00 p.m. Paris time, the world adopted a new international standard of length — a wavelength of light — replacing the meter bar that has served as the standard for over 70 years. The action was taken at the 11th General Conference on Weights and Measures. Also adopted at the Conference was a new definition of the second of time. It is now equal to 1/31,556,925.9747 of the tropical year 1900—instead of 1/86,400 part of the mean solar day.

The world's proven natural gas reserves have been estimated by the U. S. Bureau of Mines to be 660 trillion cu ft, as of December 31, 1959. Of that total, U. S. and Canadian reserves are 280 trillion cu ft. Middle East reserves, including those in Egypt, are 200 trillion cu ft. Proven reserves for other areas include Russia, 81 trillion cu ft; Caribbean America, including Venezuela, 40 trillion cu ft; other Southern American areas, 10 trillion cu ft; North Africa, 30 trillion cu ft; Far East, 10 trillion cu ft; Europe, 9 trillion cu ft.

Toledo City Council reversed its previous decision and on October 24 granted Panhandle Eastern Pipe Line Company a "limited right" to bring natural gas to new industrial customers in the greater Toledo area. A week earlier the city's governing body had turned down the proposal. Ohio Fuel Gas Company, which holds the franchise to serve the city, opposed the move, and is expected to test the action in the courts.

Does a gas utility have to read meters every month? East Ohio Gas Company has turned to reading meters every-other-month and estimating consumption in the months when readings aren't made. The practice is saving the company (and its 800,000 customers) about $375,000 annually. Not all the utility's customers are happy about the arrangement, though, and many have complained to the Cleveland City Council utilities committee that they are being "overcharged."

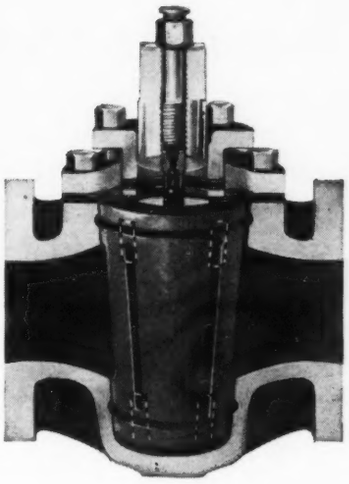
AMERICAN GAS JOURNAL, December, 1960, Vol. 187, No. 13. Published monthly except August, then semi-monthly by The Petroleum Engineer Publishing Company, P. O. Box 1589, Dallas, Texas. Second class mail privileges authorized at Dallas, Texas. Executive and Editorial Offices at 800 Davis Building, P. O. Box 1589, Dallas 21, Texas.

the idea:

Force Can Be Multiplied Through Hydraulics

Blaise Pascal in 1625 demonstrated that a given force can be multiplied almost infinitely through use of hydraulics. His principle: "a unit pressure applied to the liquid contained in a sealed vessel is transmitted to every part of the liquid with undiminished force, thus multiplying the force many times . . ."

the application:



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In the Rockwell-Nordstrom valve (the *original* lubricated plug type), lubricant is injected under pressure creating powerful instantly replaceable seals against leakage in the Sealdport® grooves between plug and body. Lubricant also hydraulically jacks and balances the plug to maintain perfect seating, instant operation.

the benefits:

Positive Shut-Off . . . Instant 1/4-Turn Operation . . . Unexposed Seating, Longer Life, Lower Cost

For a full range of services, Rockwell-Nordstrom lubricated plug valves insure the trouble-free operation and freedom from wear and repair that you can only expect from a *lubricated* mechanism. See your supplier or write for complete details on Rockwell-Nordstrom lubricated plug valves, lubricants and operating accessories. Or better yet, have a Rockwell field engineer visit you. Rockwell Manufacturing Company, Dept. 103M, Pittsburgh 8, Pa. Canadian Valve Licensee: Peacock Brothers Limited. If you live outside the U. S. or Canada, write: Rockwell International S.A., Geneva, Switzerland.

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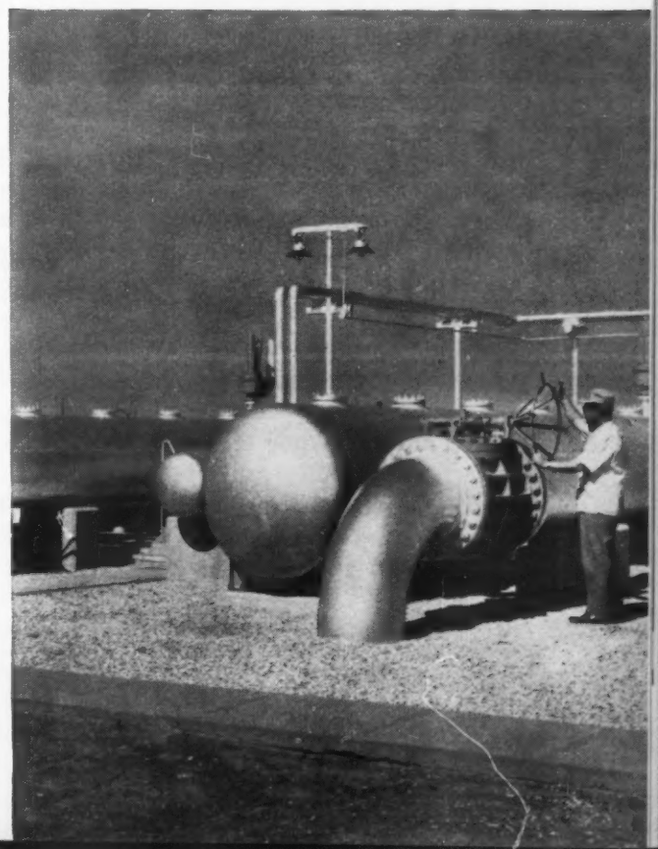
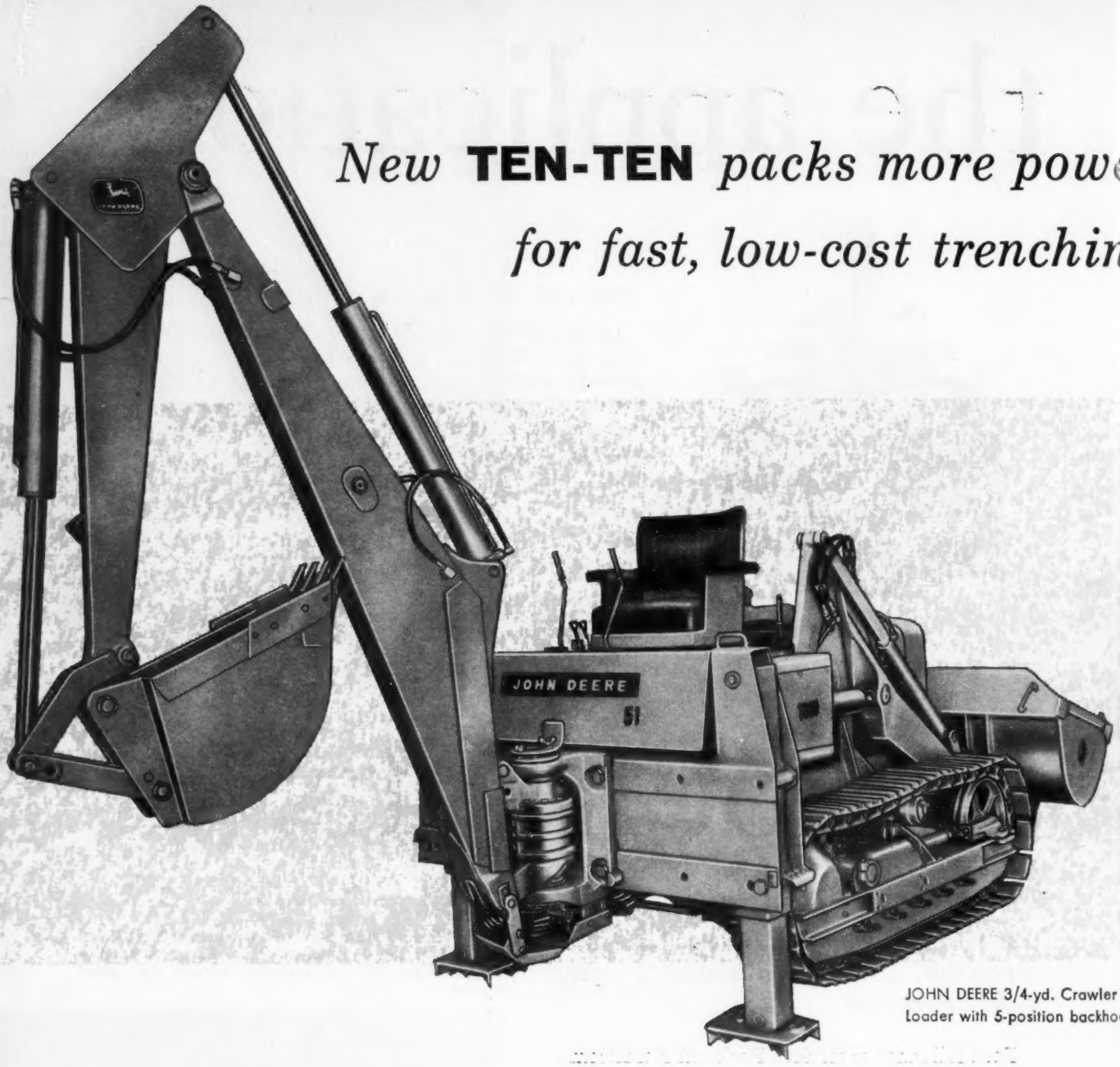
Rockwell-Nordstrom pipeline valves close 2 to 5 times faster than non-lubricated valves. Powerful positive seals of pressurized lubricant assure leak proof operation.



New **TEN-TEN** *packs more power for fast, low-cost trenching*



JOHN DEERE 3/4-yd. Crawler Loader with 5-position backhoe.

Now there's forty engine horsepower behind the controls of the John Deere Backhoe—smooth-handling power for efficient, on-schedule construction of gathering lines, mains, feeders and services. With either Diesel or gasoline engine, you get the benefits of John Deere's 4-cylinder, 4-cycle, valve-in-head design, with an optional new wet-clutch and hydraulic direction reverser.

Two John Deere Backhoes meet every trenching need. The five-position 51 centers or slides to flush left or right mountings for digging next to walls, fences or buildings. Both the 51 and the center-mounted 50 operate with simple two-lever control, and have individually adjusted stabilizers. Backhoe-Loaders, Backhoe-Dozers, and Backhoe-Loaders with Sidebooms are standard John Deere units preferred for utility construction work.

Complete specifications are available through the John Deere construction equipment dealer. He is ready to provide information, too, on long-term leasing arrangements now available.

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Now—an all-season tape that handles the toughest jobs. Ideal for field-wrapping under cold weather and other adverse climatic conditions. Provides excellent insulation properties and improved electric strength; resists acids, alkalies, salts, oils, gasoline and naphtha. Try it yourself and see . . . send in the coupon below for your free 9-foot sample roll.

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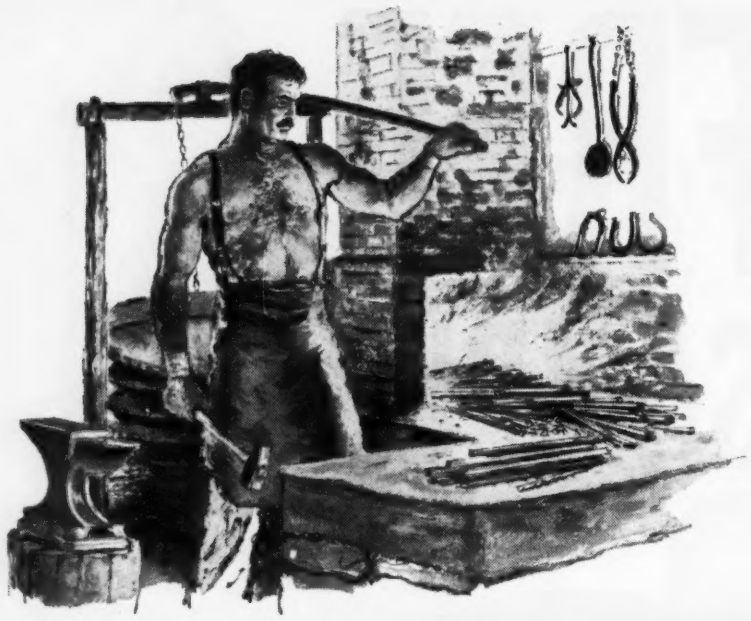
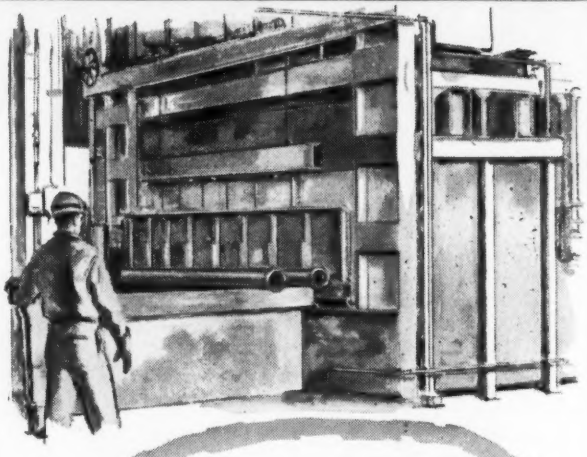


THE BLACKSMITH . . . legendary figure of other days, heated his metals in a crudely built forge.

BASIC...but better than ever today



TODAY . . . dependable gas supplies heat for thermostatically controlled heat treating furnaces such as used for our cast iron pipe.

Cast iron pipe's reputation for long life was won the hard way—by proved performance in the field.

Throughout the country today many cast iron gas mains, a century and more old, are still serving.

This outstanding record is the result of cast iron's inherent quality. Quality that we, for one, maintain at maximum levels by supervising every production step from mine to finished product.

You can depend on U. S. Pipe. It is quality-controlled in manufacture to insure top performance in the main.

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- Joint design allows for deflection during and after installation.
- Service connections are easily made
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- No shortages. Cast Iron Pipe is immediately available.

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A WHOLLY INTEGRATED PRODUCER FROM MINES AND BLAST FURNACES TO FINISHED PIPE.

U.S. cast iron PIPE
CAST IRON

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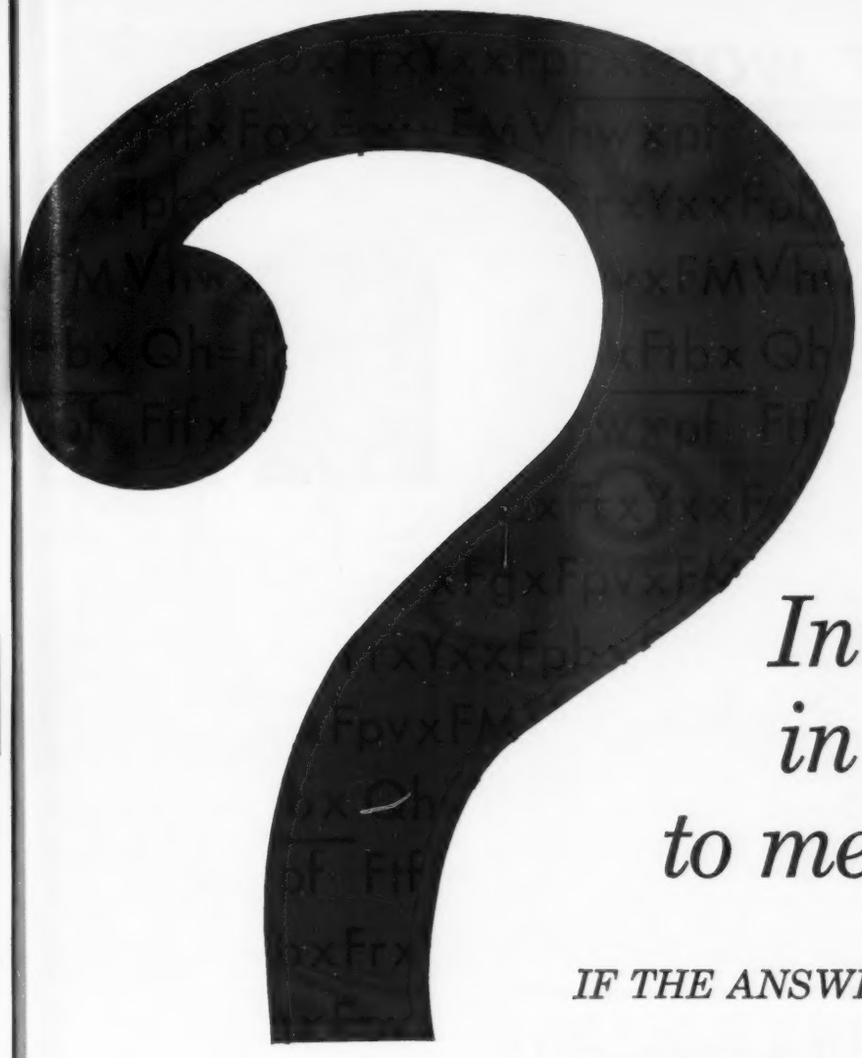

Interested in a new way to meter gas?

IF THE ANSWER IS NO...READ THIS!

The Mass Flowmeter is the first significant challenge to volumetric metering of flowing gas. The Mass Flowmeter meters fluid mass. The volumetric variables—pressure, temperature, supercompressibility and the rest—which affect volumetric metering do not affect the Mass Flowmeter. No extra recording or measuring instrumentation is required. Meter readout is direct, immediate and accurate . . . in pounds. Only a specific gravity reading is required to convert the pound reading to volume.

If you want to know more about the BS&B True Mass Flowmeter contact your BS&B sales representative or write: BLACK, SIVALLS & BRYSON, INC., MASS FLOWMETER SALES, P.O. Box 1714 Dept. 3-B012 Oklahoma City, Oklahoma.

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BS&B mass flowmeter

MEN AT WORK

IN THE GAS DISTRIBUTION INDUSTRY

● **K. Albert Miegl** has been appointed chief engineer of Arkla Air Conditioning Corp. and **Robert K. Spear** has been named assistant to the vice president—engineering research and development. Miegl succeeds **Dr. Phillip P. Anderson,** who recently was promoted to vice president in charge of engineering, research and development.

K. A. Miegl

E. E. Bagley

● **Edward E. Bagley,** formerly chief of operations of Northern Ontario Natural Gas Co. of Toronto, Canada, has been appointed sales manager of Reynolds Gas Regulator Co., Inc., wholly-owned subsidiary of Arkansas Louisiana Gas Co. He succeeds **Clarence E. Baker** who has become affiliated with Arkla Air Conditioning Corp., another ALG subsidiary.

● Citizens Gas and Coke Utility of Indianapolis elected **J. Ralph Fenstermaker** a member of the company's board of directors for 15 years, to vice president of the board, the post held by Leroy J. Keach, who died May 3. **John Burkhart,** president of The College Life Insurance Co. of America, was named a director to succeed Keach. Fenstermaker is president and co-founder of Hugh J. Baker and Co., one of largest independent fabricators of structural steel in the U. S. Citizens Gas also announced the promotion of **Charles Turner,** engineer for Citizens since 1946, to assistant director of manufacturing succeeding Arthur W. Lockhart who died June 13.

● **J. L. Harrison,** general manager of Lancaster County Gas Division, The United Gas Improvement Co., has announced the appointment of **Robert L. Yeager** as operating manager of the Lancaster Division succeeding **Andrew J. Leib** who is retiring after 45 years of service with the company. **Edward J. Potts Jr.,** has been appointed superintendent of mains and services in the Lancaster Division. Changes were effective November 1.

● **Robert V. Jebavy** has joined the Dallas engineering staff as distribution engineer for Southern Union Gas Co. In this capacity he will handle gas supply planning, design, and construction planning, technical supervision of construction and operations, etc.

● **Russell W. McIntosh** has joined Kralastic sales department of Naugatuck Chemical Div., U. S. Rubber Co. As a member of the marketing section of Kralastic sales department he will be responsible for promoting use of Kralastic in pipe on a national basis.

● **Jules C. Laegeler** has been appointed vice president in charge of engineering for The Frank G. Hough Co. Other appointments include **Keith W. Kampert** to chief engineer, product design; and **Thorvald Granryd** to chief engineer, research and development.

J. C. Laegeler

R. T. Oliver, Jr.

Industrial Silencer Div. of Burgess-Manning Co., Dallas, has announced promotion of **William A. Carroll Jr.** from sales manager to manager of marketing, and **R. T. Oliver Jr.,** former New York district sales manager, to sales manager for domestic operations.

Recent Appointments

Ernest R. Breech, former chairman of the board, Ford Motor Co., has been elected to the Whirlpool Corporation board of directors, filling the vacancy created by retirement of **Maynard H. Murch.**

Milton S. Sachs, recently retired chief hydrologist with the Bonneville Power Administration, has joined the consulting staff of H. Zinder & Associates.

Lindley K. Nichols, former manager of management engineering studies for the Radio Corporation of America at New York, has joined the management consulting division of Ebasco Services, Incorporated, as chief consultant.

The S. J. O'Brien Companies, one of New York City's largest distributing companies, and one of the world's largest refrigeration service organizations, has been appointed distributor for Arkla Air Conditioning Corp.

Trinity Steel Company, Inc., of Dallas, Texas, has announced the appointment of **Rex Bircket** as custom sales representative for the company in the Tulsa area.

Superior Meter Div., Neptune Meter Co. has appointed **Fred Stevenson Sr.,** as sales representative in the southeast to handle sales of gas meters.

Recent Promotions

Lee Zoeckler, former sales supervisor for Permaglas Division of A. O. Smith Corp., has been appointed manager of sales and product training.

Rockwell Manufacturing Co.'s Meter & Valve Div. has announced the following promotions: **James H. Sells,** formerly district sales manager in Kansas City, Missouri, to district manager in the Houston area. **James Dvoracek,** formerly assistant southwestern regional manager, has been named midwestern regional manager. **William W. Shade,** formerly a sales engineer in the Kansas City, Missouri, district, has been named district manager for the district.

Walter P. Hooper, formerly executive vice president of Panellit Inc. prior to the merger of the organization with Information Systems, Inc., has been appointed vice president and general manager of Information Systems, Panellit Div. in Skokie, Illinois.

DIG THESE DITCHING DOLLARS

...with the NEW, RUGGED, LOWER COST

Everett® Trencher S-1500

Distributorships and Dealerships Available

S-1500...FITTING COMPANION FOR THE EVERETT 2000 SERIES...

Digging depth to 42", width 12" standard. Up to 18" width in 2" increments by use of bucket extensions. Speed up to 600' per hour with Everett reduction transmission. Cuts trenching costs. Send for information.

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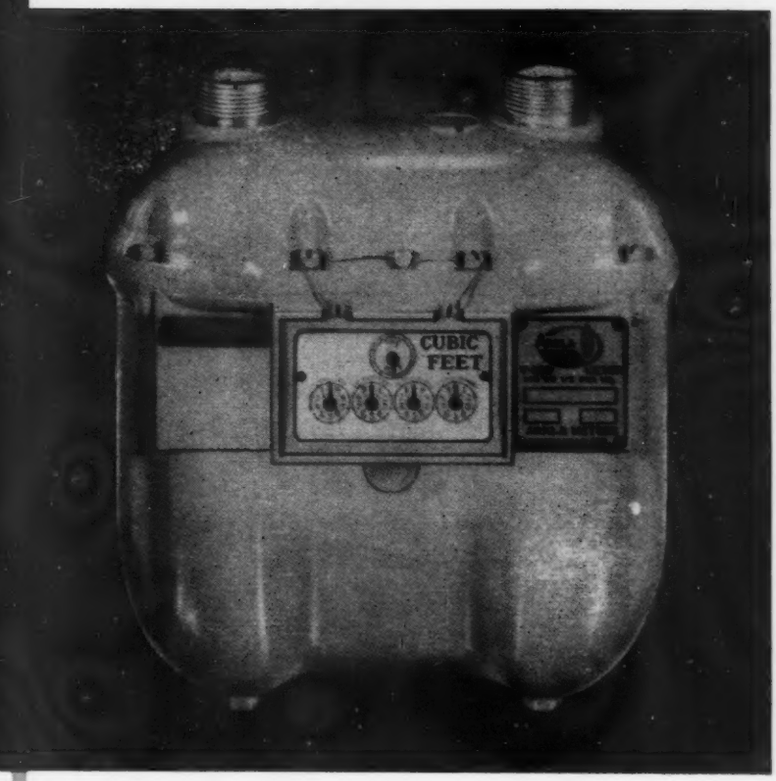
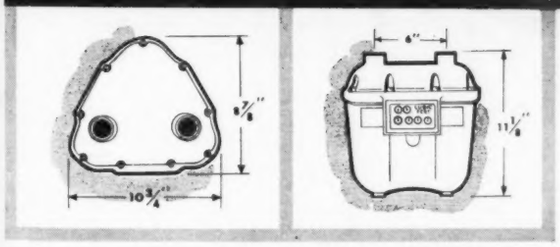
V 250





Dimensions: The Arkla V250 Gas Meter weighs less and is smaller than any other 250 cu. ft./hr. gas meter.

A NEW, COMPACT, ACCURATE "CASH REGISTER" FOR THE GAS INDUSTRY!

EXCELLENT ENGINEERING AND DESIGN of this gas meter, first of a new, modern line, are evident in its light weight and compactness that make the Arkla V250 Gas Meter easy to install . . . fewer moving parts reduce maintenance . . . accuracy of the Arkla V250 Gas Meter makes it a welcome "cash register" for the gas industry.

Order ARKLA V250 GAS METERS TODAY. *(Other models available soon.) For further information, write or call us, or ask your Arkla-Reynolds Gas Regulator representative.*

ARKLA

WRITE OR CALL:

A Division of Arkla Air Conditioning Corporation

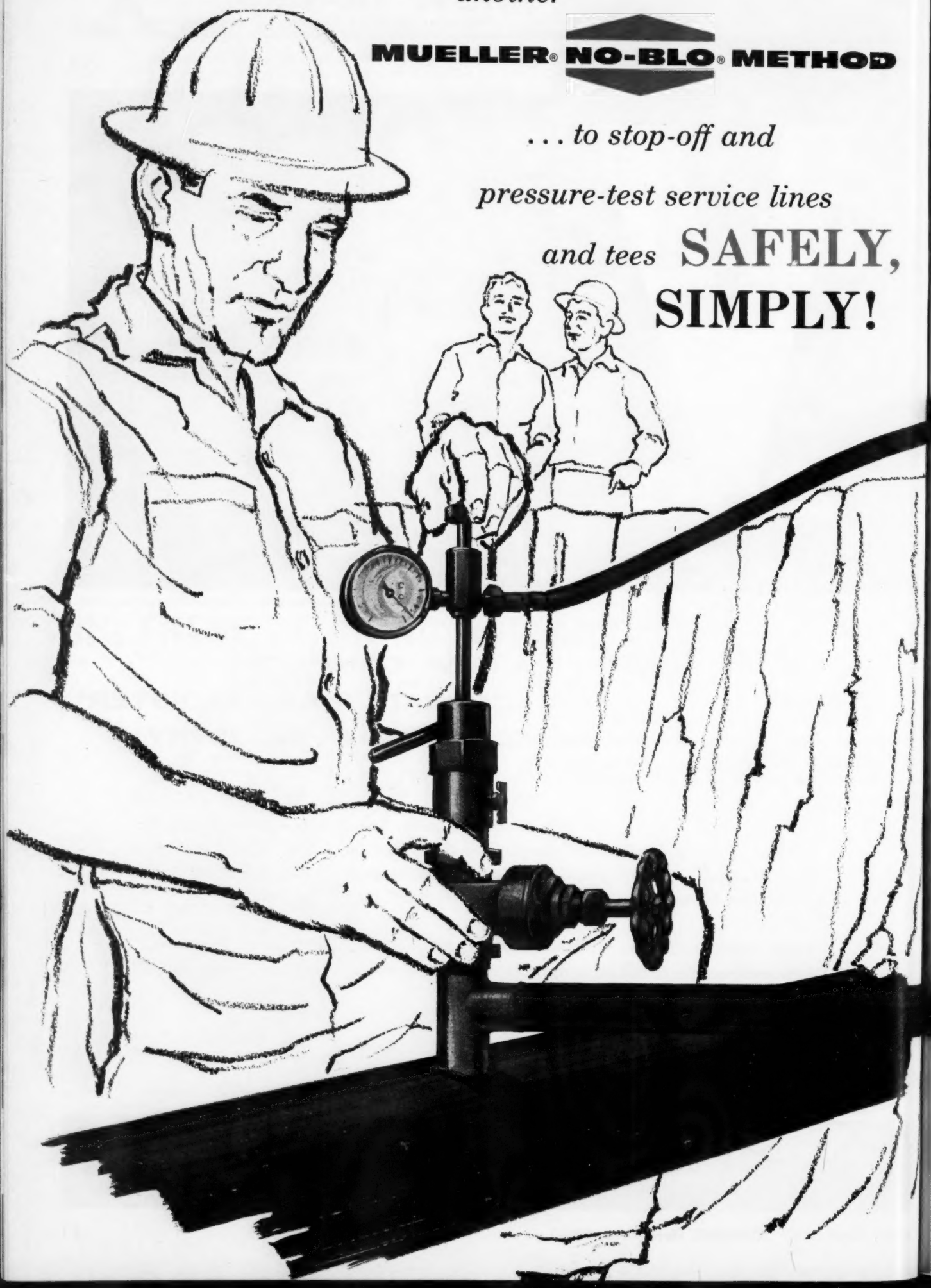
another

MUELLER® NO-BLO® METHOD

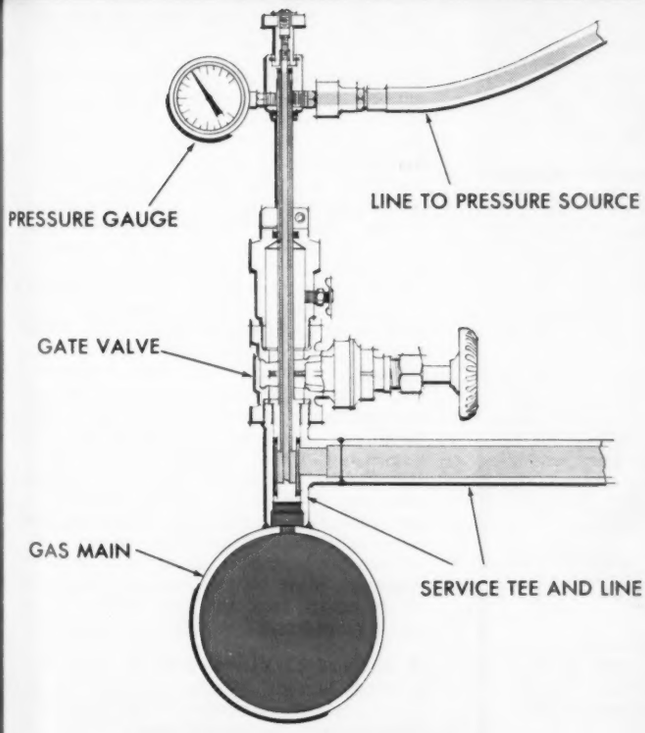
. . . to stop-off and

pressure-test service lines

and tees **SAFELY, SIMPLY!**



■ Here's a new and versatile machine and procedure for pressure-testing new, repaired or relocated mains and services. Just one lightweight, compact machine will stop off a damaged service line and perform a stand up test after completion of repairs. Specifically designed for stand up testing, the machine can be used to stop-off service tees whenever welding repairs are not needed on the tee inlet or outlet. A special connection permits an outside source of pressure to be easily connected for testing the job before or after the main is drilled. Depending on pressure available and flow requirements, the machine further demonstrates its versatility by maintaining *gas service* from an outside source during main changeovers and similar operations.



MAIN PRESSURE STOPPED OFF... OUTSIDE PRESSURE SOURCE IS TESTING COMPLETED REPAIRS.

Typically-rugged Mueller quality

The steel construction and strategically-placed O-ring seals permit the unit, available in ¾" and 1" sizes, to contain working pressure up to 125 P.S.I.

MODEL H-17020 MACHINE

For use with gate valves. (H-17021 Machine, for use with H-17025 control chamber, also available.)

The Mueller No-Blo Service Tee Stopping Machine and Stand Up Tester is safe, simple and economical. Its variety of talents and ease of portability makes it a valuable new member of every field maintenance crew.

Write for complete information and specifications.

MUELLER CO.

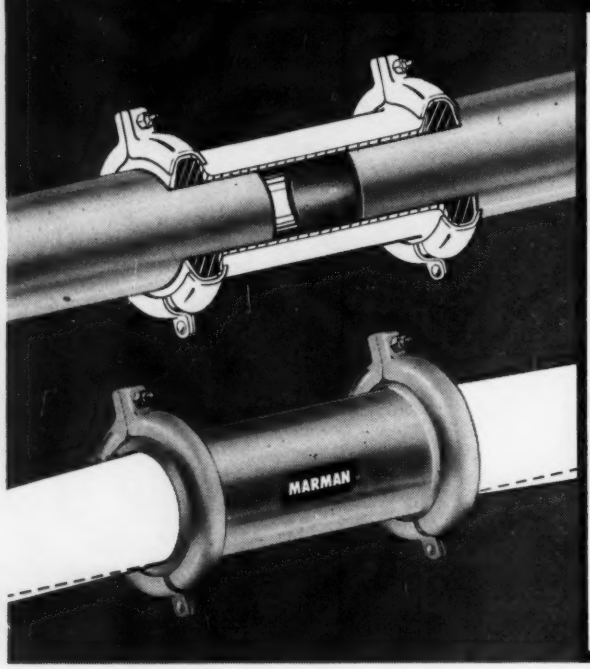
DECATUR, ILL.

Factories at: Decatur, Chattanooga, Los Angeles
In Canada: Mueller, Limited, Sarnia, Ontario

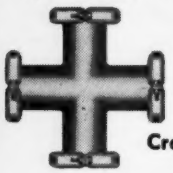
5569

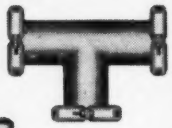
GEM Sponsor

Use MARMAN FLEXMASTER to Simplify Pipe Connections



WIDE RANGE OF STYLES AND SIZES


Crosses

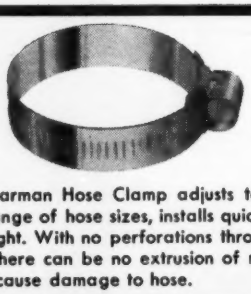

Tees

Many Lengths

45° & 90° Elbows

Marman FLEXMASTERS are designed to join pipe quickly without cutting or threading. The illustration above shows how the easy-to-remove hinged couplings grip the pipe securely, yet absorb vibration, shock and minor axial and angular misalignment without leakage. FLEXMASTERS are available in lengths from 2″ to 36″, for pipe sizes from 3/8″ to 4″. For complete information on this and other Marman products, return the coupon for new product bulletins.

PATCHMASTER stops pipe leaks permanently, conforms to any pipe contour, sizes for ½″ to 24″ pipe.



New Marman Hose Clamp adjusts to a wide range of hose sizes, installs quickly, stays tight. With no perforations through band, there can be no extrusion of rubber to cause damage to hose.

FLEXMASTER and PATCHMASTER are Aeroquip Trademarks.

Aeroquip
REG. TRADEMARK

MARMAN DIVISION

AGJ-12

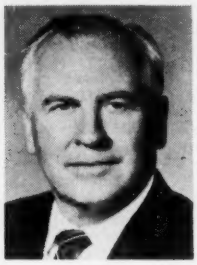
11214 EXPOSITION BLVD., LOS ANGELES, CALIFORNIA
IN CANADA: AEROQUIP (CANADA) LTD., TORONTO 19, ONTARIO
Marman Products are Covered by U.S. and Foreign Patents and Other Patents Pending

Please send bulletins on products checked.

☐ FLEXMASTER
☐ PATCHMASTER
☐ Hose Clamp

Name_____
Title_____
Company_____
Address_____
City_____ Zone_____ State_____

● **Robert K. Eskew** has been appointed vice president and director of engineering of Bryant Manufacturing Co. He was formerly vice president and director of engineering for Arkla Air Conditioning Corp. in Evansville, Indiana.


R. K. Eskew

F. J. Nunlist

● **Frank J. Nunlist** has been appointed to the new position of vice president, operation, of Worthington Corp. Formerly a group vice president, Nunlist will be responsible, in his new position, for activities of all 16 domestic operating divisions of the company.

● Southern California Gas Co. has named **C. R. Rikel** division manager, Northeast division to succeed the late Myron Thomas. In his new position, Rikel will be in charge of operations in Pasadena, South Pasadena, San Marino, Alhambra, San Gabriel, and Altadena areas.

● **Franklin S. Wade** has offered his resignation as chairman of the board of directors of Southern California Gas Co. The former president of SoCal and Southern Counties Gas Co., affiliate of SoCal, will continue to serve both companies in a consulting capacity and will retain office in the 810 South Flower Street building.

● Southern Counties Gas Co. has announced several recent personnel changes —appointment of **Frank Metcalfe,** as air conditioning sales engineer. In Santa Monica Bay division, five people have moved to new job titles: **Ray Anderson,** customers department manager, changes to accounting department manager; **Bob Robb,** customer service supervisor, becomes customers department manager; **Bill Delaney,** customer service foreman, advances to customer service supervisor; and **Jack Julian,** dispatch supervisor, has been transferred to general office customer service for 6 months, after which he will return to Santa Monica as customer service foreman. **Sam Bonnick,** utility clerk, has been promoted to dispatch supervisor.

● **Richard C. Vierbuchen,** has been appointed director of sales of Washington Gas Light Co., succeeding **Herbert H. McMurray,** who has retired after 30 years of service with the utility. Vierbuchen has formerly been engaged in rate and financing work for WGL.

● **R. F. Kehrer** has been appointed parts marketing manager of the newly-created central parts division of J. I. Case Company. His responsibilities will include parts catalogs, parts price lists and bulletins, sales bulletins, and sales promotion material.

● Hill Hubbell Company recently appointed **Norman A. Morella** as project engineer. Formerly he was associated with Perfection Industries and Baker-Rauling Company.

● **Kirk P. Harger** has been appointed eastern sales manager, steel products division of Kerotest Manufacturing Co

Men at Work

● **Dean William Caple,** supervisor of the corporate department of Rochester Gas and Electric Corp., has been elected assistant secretary of the company.

D. W. Caple

C. W. Watson

● **Charles W. Watson** has been elected vice president, general administration, of Philadelphia Electric Co. He was formerly assistant to the president.

● Kraloy Plastic Pipe Co. has appointed **R. Q. (Dick) Swindler** as representative to serve the West Texas-Southeast New Mexico area from headquarters in Odessa, Texas. **E. E. Tedford** of Shreveport has been appointed to cover East Texas, North Louisiana, Arkansas and Mississippi. **J. R. Deaver Jr.,** has been appointed to serve South Louisiana from Lafayette, Louisiana.

● **William F. Haley** has been appointed manager of the newly-established southwest district office of Union Switch & Signal — Division of Westinghouse Air Brake Company in Houston, Texas. Previously, he has been area representative for systems marketing in the southwestern area. **William L. Hendricksen,** sales engineer, will assist Haley.

● Ludlow Valve Manufacturing Company, Inc. has appointed **Robert J. Mettler** of Lima, Ohio, as district sales manager for Ohio, Indiana, and Kentucky.

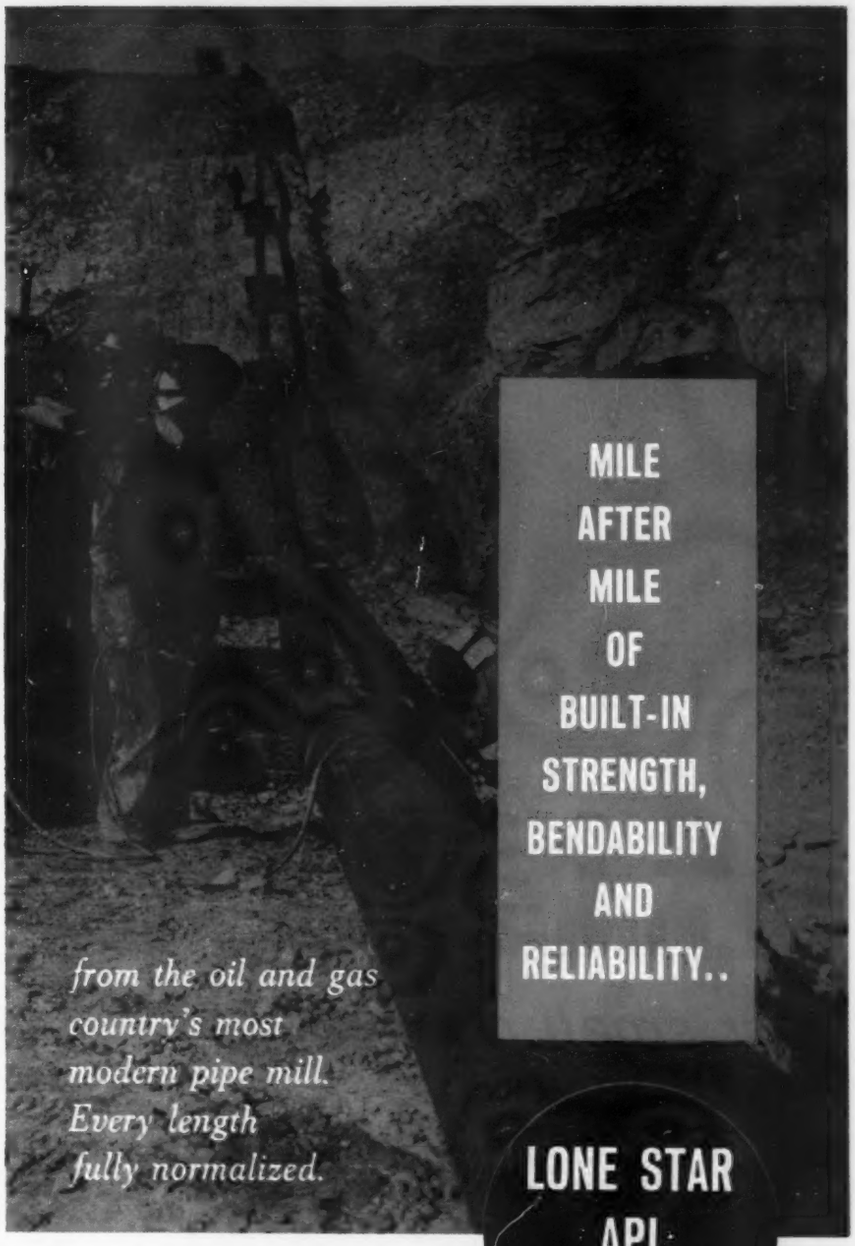
● **Theodore M. Chubb** has joined H. Zinder & Associates, consultants. He was formerly chief engineer and general manager of the department of Public Utilities & Transportation for the City of Los Angeles. Company simultaneously announced it is opening permanent offices in Los Angeles.

● **Robert D. James** has been appointed manager of A. M. Byers Company's southwestern division; his headquarters will be in Houston, Texas.

● **A. Earl Lee** has been appointed vice president in charge of the newly-established marketing division of J. I. Case Company, Wisconsin manufacturer of industrial tractors and equipment. Lee, who was marketing co-ordinator, assumes responsibility for all Case sales and merchandising activities, including sales, advertising, parts, service, and related supporting staff functions.

● **Robert W. Kerr** has resigned as president and director of Fairbanks, Morse & Company to become president of Fluor Products Company, a division of The Fluor Corporation, Ltd.

● **William D. Carlson** of Blue Belle, Pennsylvania, has been promoted to district supervisor for Heath Survey Consultants, Inc. covering eastern Pennsylvania, New Jersey, Delaware, and Maryland.



Joe Roughneck's Pipe Mill

Lone Star STEEL COMPANY

EXECUTIVE—SALES OFFICES
W. Mockingbird Lane at Roper • P. O. Box 12226 • Dallas, Texas
DISTRICT SALES OFFICES
912 Republic National Bank Building, Dallas, Texas
Houston, Texas | Midland, Texas | Tulsa, Oklahoma

AMERICAN AL-800

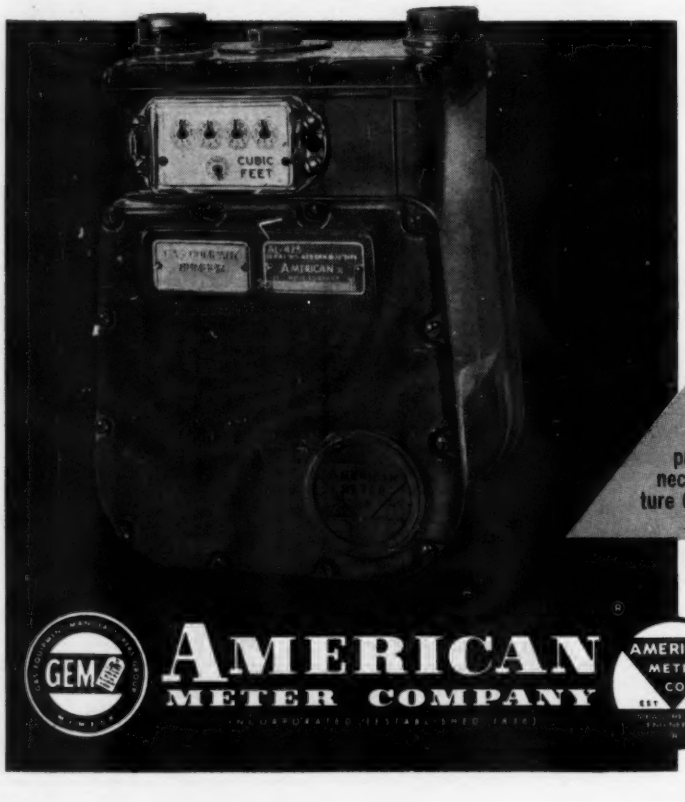
For medium sized industrial or commercial loads. Weighs only 46 pounds. Rated capacity 800 cfh at ½-inch w.c. and 1700 cfh at 2-inches w.c. differential with 0.64 sp. gr. gas. 20 psi maximum working pressure. Connections 1½-inch MC. Permanent steel connection threads eliminate galling. May be equipped with Base Pressure or Base Volume Index and Volume and Pressure Gage. To be available with Temperature Compensation.

See Bulletin 317 for complete specifications.

American "design for durability" features are built into these latest additions to the Aluminumcase line, making them the most compact and lightest meters available for their capacity rating. The compact, lightweight aluminum alloy construction provides ruggedness and high resistance to impact damage with savings in shipping, handling and setting costs.

2 NEW AMERICAN® ALUMINUMCASE METERS

for small commercial and industrial loads



American's new AL-425 and AL-800 Aluminumcase Meters incorporate the same time-proven, dependable design used throughout the line of positive displacement meters. Both meters feature bellows-type Duramic diaphragms for all fuel gas services, D-slide valve construction and refinements in design and materials pioneered by American to give *longest service life at lowest cost per meter per year.*

AMERICAN AL-425

For small industrial or commercial loads. Weighs only 18 pounds. Rated capacity 425 cfh at ½-inch w.c. differential with 0.64 sp. gr. gas. 10 psi maximum working pressure. Connections 1¼-inch MC. Permanent steel connection threads eliminate galling. Available with Temperature Compensation.

See Bulletin 314 for complete specifications.

GEM

AMERICAN METER COMPANY

AMERICAN METER CO EST 1836

GENERAL SALES OFFICE: Philadelphia 16, Penna. • Albany • Atlanta • Baltimore Birmingham • Boston • Chicago • Dallas • Denver • Erie • Houston • Kansas City • Los Angeles • Minneapolis • New York • Omaha • Pittsburgh • San Francisco • Seattle • Tulsa • Wynnewood.
IN CANADA: Canadian Meter Company, Ltd., Milton, Ontario • Calgary Edmonton • Montreal • Regina • Vancouver.

COMING EVENTS IN THE GAS DISTRIBUTION INDUSTRY

December

5 - 9 A.G.A. Gas Air Conditioning Sales School, Nationwide Inn, Columbus, Ohio.

January, 1961

17 NEGA operating division, Statler Hilton Hotel, Boston, Massachusetts.

17-19 Instrument Society of America winter instrument-automation conference and exhibit, Sheraton-Jefferson Hotel, St. Louis, Missouri.

February

3 NEGA-C-H-I division, Sheraton Biltmore Hotel, Providence, Rhode Island.

15 NEGA street department supervisors group, Hotel Bancroft, Worcester, Massachusetts.

23-24 A.G.A.-PCGA joint public relations conference, Benson Hotel, Portland, Oregon.

March

2- 3 SGA transmission management, Sheraton-Dallas, Dallas, Texas.

13-17 National Association of Corrosion Engineers, annual conference, Hotel Statler, Buffalo, New York.

16-17 SGA distribution management, Dinkler Plaza Hotel, Atlanta, Georgia.

16-17 NEGA annual meeting, Statler Hilton Hotel, Boston, Massachusetts.

16-17 Oklahoma Utilities Association, annual meeting, Tulsa Hotel, Tulsa, Oklahoma.

27-28 Mid-West Gas Association annual meeting and convention, Sheraton-Fontenelle Hotel, Omaha, Nebraska.

April

4- 6 A.G.A. research and utilization conference, Cleveland, Ohio.

6- 7 PCGA distribution conference, Biltmore Hotel, Los Angeles, California.

9-13 ASME Oil & Gas Power conference and exhibit, Jung Hotel, New Orleans, Louisiana.

10-21 American Welding Society, International Institute of Welding, annual convention and welding exposition, Sheraton-Atlantic, New York, New York.

11-13 A.G.A. sales conference on industrial and commercial gas, Prince Edward, Windsor, Ontario, Canada.

13-15 GAMA annual meeting, Boca Raton, Florida.

18-20 Southwestern Gas Measurement Short Course, University of Oklahoma, North Campus, Norman, Oklahoma.

24-26 Southern Gas Association, annual convention, New Orleans, Louisiana.

30-May 2 Independent Petroleum Association of America, midyear meeting, Roosevelt Hotel, New Orleans, Louisiana.

May

4- 5 PCGA transmission conference, Biltmore Hotel, Santa Barbara, California.

8-12 A.G.A. operating section distribution and production conference, Sheraton Hotel, Philadelphia, Pennsylvania.

14-18 National Fire Protection Association annual meeting, Detroit, Michigan.

Sell more "tough buyers" with Reznor

REZNOR gas-fired DUCT FURNACES

keep installation and maintenance costs low

These features make Reznor furnaces more adaptable, cut installation time and costs:

- mounting pipes at all four corners permit easy suspension or base mounting;
- double-lip flange simplifies air-tight connections;
- air can flow through heat exchanger in either direction;
- controls can face each other when heaters are in tandem;
- built-in draft diverter is reversible;
- flue collar is interchangeable for horizontal or vertical installations.

These features insure long-run economy, easy maintenance:

- Reznor furnaces have long-lasting, corrosion-resistant aluminized or stainless steel heat exchangers and non-clogging steel burners, easily accessible from front or rear;
- every furnace is flame-tested and shipped complete with U/L approved controls.

Whatever system you're planning—central heating, year-round air conditioning, make-up air, process air—Reznor fills any requirement. Heaters may be used singly in capacities up to 300,000 Btuh, or in tandem or side-by-side arrangement for greater heating requirements. Reznor blowers available. Ask your Reznor representative for Catalog SA-5900. Or write Dept. 66Y, Reznor Manufacturing Co., Mercer, Pa.

REZNOR HEATERS

"WORLD'S LARGEST SELLING DIRECT-FIRED HEATERS"

NEWSREEL

New SGA Manual Compares Gas and Electric Heat Methods . . . "Comfort . . . in Whole House Heating," a new 16-page manual prepared to answer the many questions posed by gas versus electric heating, has been published by the Southern Gas Association and is now available for distribution. Designed as an education piece, the manual may be used to inform gas company personnel, heating dealers, and heating equipment salesmen, about the factual story of heating with electricity, and how it compares with gas "fresh air" heating. As a consumer piece, it can be left with the prospective customer for review and future reference.

Prepared under the direction of S.G.A.'s Heating and Air Conditioning Committee the four-color manual presents a comparison of the two home heating methods in "laymen's language."

The manual uses a table prepared by H. Zinder & Associates, utility consultants, and a fuel cost comparison chart to show that fuel cost for electric heat, on a Btu basis, is up to 8 times higher than natural gas. By applying gas and electric rates to the chart, the comparative costs of gas and electric heat can be figured for any geographical location. Of particular interest is the chapter on looking at today's electrical heating equipment . . . objectively, that openly and frankly discusses the relative merits of electric heat and provides detailed information on the six basic types of electric heating equipment and characteristics of each.

It is with

Deep Regret

that we announce

the burial of multi-million dollar pipelines without insurance by a Pipetron Model 506 Buried Holiday Detector. Give your pipeline a decent burial, check your coating where it counts--in the ground! The Pipetron Detector pinpoints holidays, giving you both a visual and an audible indication. If you believe in life after burial, protect your investment by writing for the circular "You Can't Afford to Keep Buried Holidays a Secret."

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Phone POplar 5-4562

"Engineering Experience Into Products"

Sales territories available – inquiries invited.

Pittsburgh lifts ban on home use of gas disposers . . . Allegheny County, which has the strictest air pollution regulations in the nation, has reversed a long-standing ban on any type of home refuse incinerator to approve residential use of the new gas-fired automatic smokeless-odorless disposers. Coincident with the Bureau's announcement that the new gas disposers may now be installed in Pittsburgh area homes, a demonstration of the unit was made for councilmen and commissioners of the affected communities by representatives of the Gas Appliance Manufacturers Association's automatic gas disposer division at the invitation of the three gas utilities serving the area — Equitable Gas Co., Manufacturers Light and Heat Co., and the Peoples Natural Gas Co.

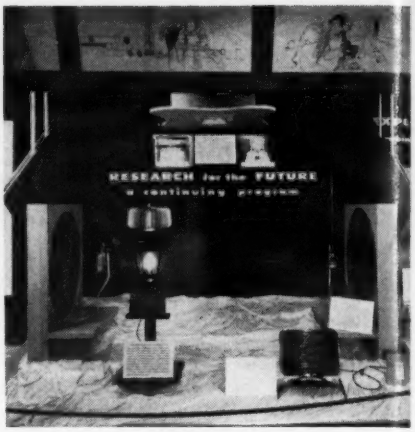
Samuel W. Horsfield, vice president of Long Island Lighting Co. has retired from the company, for reasons of health, after 33 years of service.

S. W. Horsfield

"Cold weather affects me very adversely." Horsfield stated. "I expect to spend the cold seasons in warmer climates, in the Caribbean this winter, and return in the warm weather to Long Island," he added. Horsfield started work with LILCO in 1927 as Superintendent of its Bay Shore Gas Works. In 1953, he was made Assistant Vice President and Gas Operating Manager and in 1957, he became Vice President in charge of Gas Operations.

Southern Union Gas Company has finalized plans for installation of two new electronic data processing computer systems. Both are IBM 1401 systems and scheduled for delivery in 1962. One system utilizes magnetic tape and will be used for general accounting. Customer billing and accounting will be done by the card system. One of the main advantages of the new equipment is its faster operation. Card system can read up to 800 cards per minute, punch as many as 250 cards, and produce printed output at 600 lines per minute. By comparison Southern Union's existing machines can print only 100 lines per minute, read 100 cards per minute, and punch 200 cards per minute. The magnetic tape system can take in or feed back material at the rate of 20,000 characters per second. Seventeen pieces of equipment now in operation will be replaced by the 2 new systems, which contain a total of 6 machines, plus 2 magnetic tape units.

Lone Star Steel Company's 1961 expansion plans include 3 new facilities for the production of spiral weld pipe, standard grade pipe, and improved rod mill products. The new construction program will carry the Texas steel manufacturer into at least two or three entirely new markets with a half dozen or so new products. Planned is an entirely new facility (spiral weld pipe mill) capable of making steel pipe in diameters of from 16 to 80 inches. Previously, Lone Star's pipe has been limited to 16-in. diameter steel pipe and 12-in. cast iron pipe. Special lining and coating equipment is included. A new stretch-reducing mill will be an addition to the already existing department now manufacturing steel pipe for the oil and gas industry to API specifications. The new mill will produce standard grade black or galvanized pipe and new equipment will allow coatings or linings of recently developed materials such as epoxy and plastic. A major remodeling job of the rod will enable use of both skelp-trim and prime metal, the latter to be obtained through use of a slitting machine.



Lone Star's educational exhibit during the State Fair of Texas, featured a radio-playing thermoelectric generator powered by a gas light, an Italian-made gas flameless heater and radiant heaters that may comfortably warm tomorrow's football stadium on the coldest day.

Golden Anniversary of the *Mueller Record* was marked in November by publication of the magazine with a slight variation from its regular format. Instead of stories relative to distribution of gas and water, the *Record* uses a picture story to tell how the magazine is published, the people instrumental in its publication, and how material is gathered. The picture story takes company editor Jim M. Milligan to Eddyville, Kentucky, where he gathered material for a story which is the second half of the birthday issue. The *Mueller Record*, one of the oldest company publications in the nation, started November 1, 1910, as a newsletter for salesmen of Mueller Company.

J. I. Case Company has opened a new 70,000 sq ft single floor branch house in the Twin Cities area of Minnesota, to replace the former branch house located in downtown Minneapolis. The new facility, designed for convenience and service to dealer customers, is situated on Highway 55 to provide for expansion and easy access to proposed freeways. New branch office will be supervised by P. J. Penn.

Economy Governor Co. has become a division of Sprague Meter Co. F. M. Pickering, president and founder of Economy, will continue with the company in an advisory capacity. Jack Crim, who has been associated with Economy since 1948, serving as vice president since 1956, has been made vice president and general manager of the new division. George Hughes, former chief engineer of Reynolds Regulator Co., has joined Economy as chief engineer. Economy will continue its main offices and operations in Anderson, Indiana.

"Gaslite Day" Gets Results For Western Kentucky Gas

A one-day, all-out effort to promote gas light sales produced some outstanding results in early November for Western Kentucky Gas Company.

The score: 529 Gaslite sales, 4786 customer contacts made (an average of 13.1 contacts per employee and one sale for every 9 contacts).

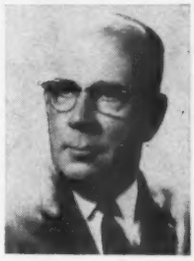
Most of the sales, reports Frank Cassada, sales supervisor, were Arkla's *Cabildo, Embassy,* and *Flair* models — priced, installed, at $39.50, $44.50 and $49.50 respectively.

On "Gaslite Day," held November 3, every employee of the utility (364 in all) was asked to contact at least 10 people and ask them to buy a gas light. District managers held brief meetings with their employees on the afternoon before Gaslite Day, and met with them twice during the special day to check progress of the promotional program.

On a year-around basis, employees receive a flat $2.50 commission for each gas light sold . . . no special or extra incentive for sales was used on Gaslite Day.

Cassada points out that 25% of Western Kentucky's meters are in an area with TVA power . . . and 120 Gaslites were sold by districts in that area.

Top honors were won by Amos Veazey of the Hopkinsville District, with 55 sales. G. J. Tankersley, company president, made his contribution by personally accounting for 10 sales.



W. J. O'Donnell

R. N. Wilson

New officers of the Wisconsin Utilities Association's Gas Operating and Gas Sales sections, elected at the fall convention in Milwaukee, are **William J. O'Donnell,** Manitowoc, executive vice president, Wisconsin Fuel and Light Co. who was appointed chairman of the gas operating section succeeding **L. A. Lenz,** Appleton, assistant gas manager, Wisconsin Michigan Power Co. **Rolla N. Wilson,** Eau Claire, merchandise manager, Northern States Power Co. was appointed chairman of the gas sales section, succeeding **Philip E. Casper,** assistant vice president-sales, Milwaukee Gas Light Co. **Ernest F. Semrad,** vice president of supply and distribution, Milwaukee Gas Light Co., was appointed vice chairman of the operating section succeeding O'Donnell. **H. S. Turkelson,** Kenosha, district manager, Wisconsin Natural Gas Co., was appointed vice-chairman succeeding Wilson. October 18-20 have been chosen as dates for the 1961 convention; Schroeder Hotel in Milwaukee will be the site again next year.

Republic Steel Corporation has licensed Hill Hubbell Co. to use its X-Tru-Coat process to coat steel line pipe. Hill Hubbell is a division of National Malleable & Steel Castings Co., and has four pipe-coating mills.

A. G. A.'s Second Gas Air Conditioning Sales School is scheduled for December 5-9 in Columbus, Ohio. Primarily instructional, the course has been designed to include technical and sales aspects of gas air conditioning. One-day field trip will provide first-hand observation of and instruction on the practical operation of all types of gas air conditioning equipment. Round-table discussion sessions will close the formal presentations each day. Enrollment is limited to 150.

Philadelphia Electric Company has been awarded the "Socrates High Award of the Year" in recognition of consistently outstanding quality in its newspaper advertising, in competition with several hundred other companies in its field, during the past 12 months. The award, presented jointly to Ernest R. Laws, Advertising Manager, and Robert C. Cox, publicity manager, is presented each October by Public Utility Ad-Views, national publication of Vincent Edwards & Co., Boston. Top 10 public utility companies in the final standings for 1960 are: Philadelphia Electric; Cincinnati Gas & Electric Co.; Kansas City Power & Light Co.; Iroquois Gas Corp.; Wisconsin Electric Power Co.; Consolidated Edison, New York; Dayton Power & Light Co.; Lone Star Gas Co., and Southern California Edison Co. Laclede Gas Co. of St. Louis was Socrates High Award Winner in 1959.

Facts About Gas and Electric Resistance Heating has been incorporated in a fact-packed booklet by Columbia Gas Systems Service Corporation for the Columbia Gas System companies who have been using it very effectively. The booklet is now available to all utilities for distribution to dealers, heating contractors, as well as their own salesmen. *Circle 25 on the Reader Service card in the back for details and a price list.*

Arizona Public Service uses a "Lazy Susan" to save time. The rotating bookstack used by girls in APS' corporate department is nothing more than two wheels placed on their sides in the center of the room and fitted with slots at the outer rim to hold more than 60 7-lb books of Univac master history records of stockholders. Supported on steel center shaft with ball bearing mounts, the wheels turn easily so that three or four persons can have their desk located around the "Susan" and "work the books" at the same time. This modern "Lazy Susan" is already a highly appreciated time and effort saver, and since approximately 1000 address changes and 500 new stockholder accounts must be processed through the histories each quarter, you can bet it isn't a "Lazy" Susan.

Oklahoma Natural Gas' "Flame Fare" cooking demonstration fared very well at the state Retail Grocers Association annual convention at Oklahoma City's state fair — it was successful in attracting more than 1800 Oklahoma City homemakers. Theme of the demonstration, "How to make your grocery dollar go further — with modern appliances and modern cooking methods," a theme with plenty of homemaker appeal in these days of spiraling costs, may have had something to do with the demonstration's success. ONG's competent home service director Ruby Skinner, (shown checking a ham she is cooking) and RCA Whirlpool appliances featured in the demonstration did the rest. Door prizes included free standing Whirlpool gas range, and automatic washer and matching gas dryer. Nearly 1000 persons attended the first show; approximately 800 more braved wind and rain to attend the second day demonstrations.

Carmen Logana, (left) foreman of meter shop, and J. Dugan, superintendent of Gas Measurement, Niagara Mohawk Power Corporation, Syracuse, N.Y.

"None of our Reeves-Vulcan synthetic diaphragms have ever needed replacement in OVER TWENTY YEARS!"

"Over 72,000 of our active meters are equipped with Reeves-Vulcan synthetic diaphragms," says Mr. Dugan. "In our new stepped-up program of meter maintenance – in which we can process 10,000 meters a month – we have ample opportunity to check the performance of these Vulcan diaphragms.

"As our meters come in for their seven-year check-up, the only diaphragms that need replacement at present are leather. None of the Vulcan synthetic diaphragms have needed replacement. This applies to those that were installed over 20 years ago.

"We have found that synthetic diaphragms sustain meter accuracy much better over long periods of time than leather diaphragms. That's why all our replacement meters are equipped with Reeves-Vulcan synthetic diaphragms. As the number of these diaphragms in use increases, we find a decrease in the number of meters that need adjustment."

How about *your* meter efficiency? You can get greater accuracy, longer service life and lower maintenance costs with Reeves-Vulcan diaphragms. There are models for practically every type of gas meter made. Both molded and crimped styles are available in any volume. Order Reeves-Vulcan synthetic diaphragms from leading meter manufacturers or directly from:

GEM

REEVES VULCAN

Reeves Brothers, Inc., Vulcan Rubber Products Division
1071 Avenue of the Americas • New York 18, New York

How To Design LOW PRESSURE GAS SYSTEMS By the "ED" Method

Simplified step-by-step design method, based on the general gas flow formula, used equivalent pipe diameters for sizing pipe to fit gas flow requirements

John M. Cummings, *Engineer,*
Industrial Department, Dallas Division of Distribution
Lone Star Gas Company, Dallas, Texas

WELL-DESIGNED GAS SYSTEMS insure adequate quantities of gas will be transported from the source of supply to points of usage and that the pipe sizes chosen will not be either too small or too large. An undersized line will result in low pressure. An oversized line cannot be justified economically.

The designer of gas lines needs to know the quantities of gas required, the length of lines, the allowable pressure drops, and the specific gravity of the gas. Using these four factors, he can select sizes for the various lines by using a special slide rule, table, or graph based on the general gas flow formula:

$$Q = C \left(\frac{d^5 h}{GL}\right)^{1/2}$$

where

- Q = Volume of gas at atmospheric pressure
- D = Inside diameter of line
- h = Pressure drop in line, inches water column
- G = Specific gravity of gas (air = 1.0)
- L = Length of line
- C = A constant (the absolute value of which is dependent on the other units in the formula) in which friction and other factors are considered.

Quantity of Gas Required

The Btu requirements, either current or anticipated, at the points of usage, determine the quantity of gas required. Because gases differ in both heating value (Btu per cu ft) and specific gravity, the designer must know these properties. The volume of gas required (in cu ft) is found by dividing the Btu requirement, normally expressed in an hourly rate, by the heating value of the gas.

Line Lengths

The lengths of the various lines in a system are usually given to the designer by others, as taken from actual measurements or plans. When the designer has some control over the location of lines, he should try to make them as short and as straight as possible. Because the general flow formula is based on straight pipe, the designer should make allowances for fittings in the line. Various tables are available that show "equivalent straight pipe lengths" for fittings. These lengths should be added to the straight lengths to obtain an "equivalent length" of line to use in designing.

Pressure Drop

Generally, the designer assumes a maximum pressure drop that should not be exceeded at any point of usage in the system. Designs based on 0.3 or 0.5-in. of water column are quite common. In some cases, a value of 10% of the initial pressure can be used. Of course, anticipated additions should be considered so that future tie-ins to existing lines can be made at points having sufficient pressure for both the old and new requirements.

Design Procedure

Design of lines for low pressure gas systems can be accomplished with the following procedure:

1) Lay out a plan of the system on paper and show the line lengths.
2) Determine the hourly gas requirements at each point of usage.
3) Determine the "equivalent length" of each section of line in the system.
4) Beginning at the source of supply, assign a letter to each connection in the system, including the points of usage.
5) At each point of usage, assume that no other gas is needed elsewhere. Using the chart, select the smallest size line needed from the source that will

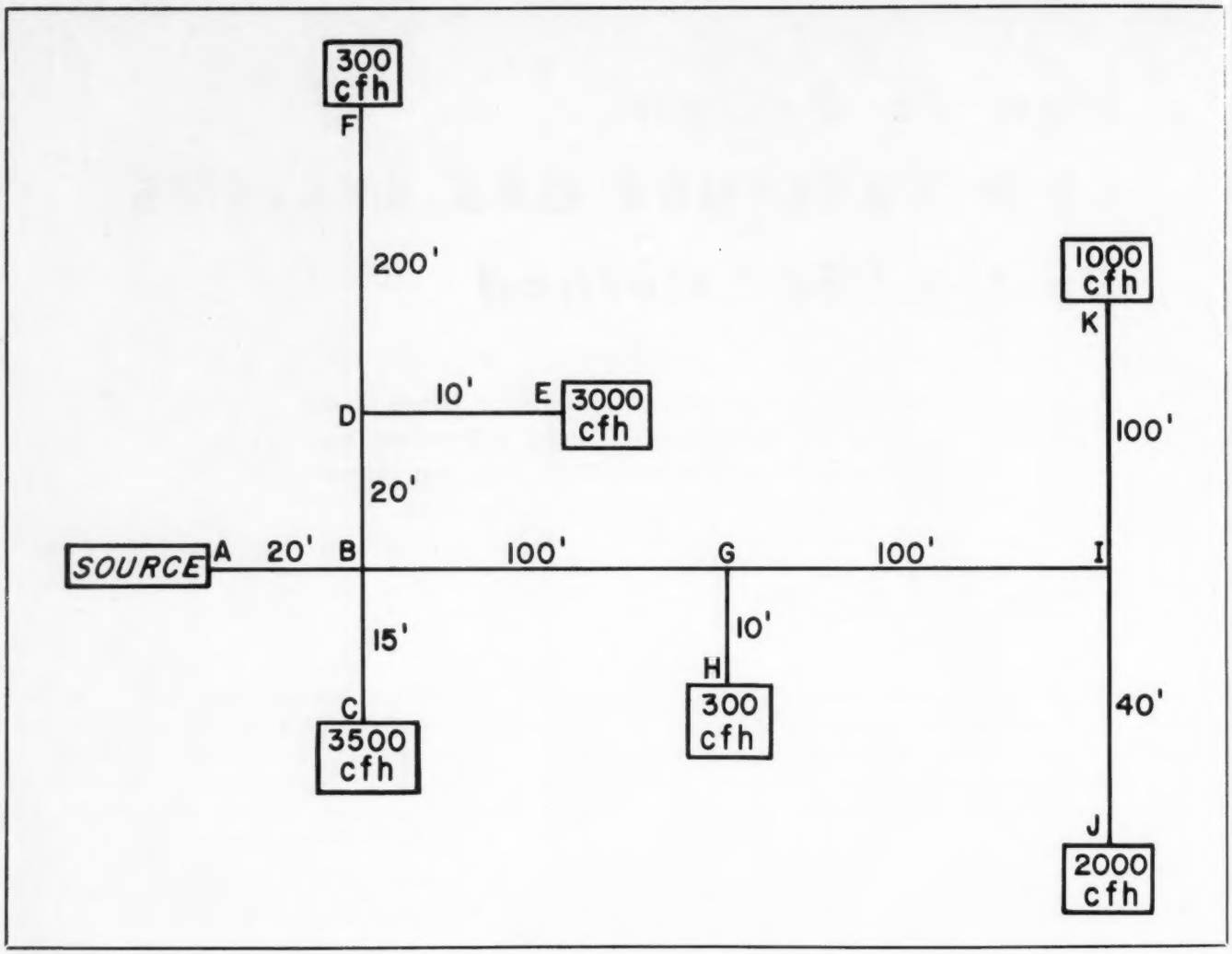


FIG. 1.

have less pressure drop than the design requirement. Show the size selected at each section on the line from the source to the point of usage.

6) Where two or more lines were determined for a section, from Step 5, find the smallest single size needed to replace them. This can be done by using the ED values shown in Table 1. Assign each of the various lines its ED value and use the sum of the ED values to determine the nearest larger nominal pipe size. Show the single size selected at each section.

7) Find the gas required at each connection lettered in Step 4.

8) Beginning at the source, use the chart to find the pressure drop in each section of line, for which the size was determined in Step 6 and gas required in Step 7. Show the pressure drop for each section and the cumulative drop at each connection.

9) Determine if the size of the branch section of line to the point of usage, as selected in Step 5, can be reduced without exceeding the allowable assumed pressure drop.

10) Show the final design size for each section of line and the pressure drop at each point of usage on the plan.

TABLE 1.
Equivalent Diameter Values

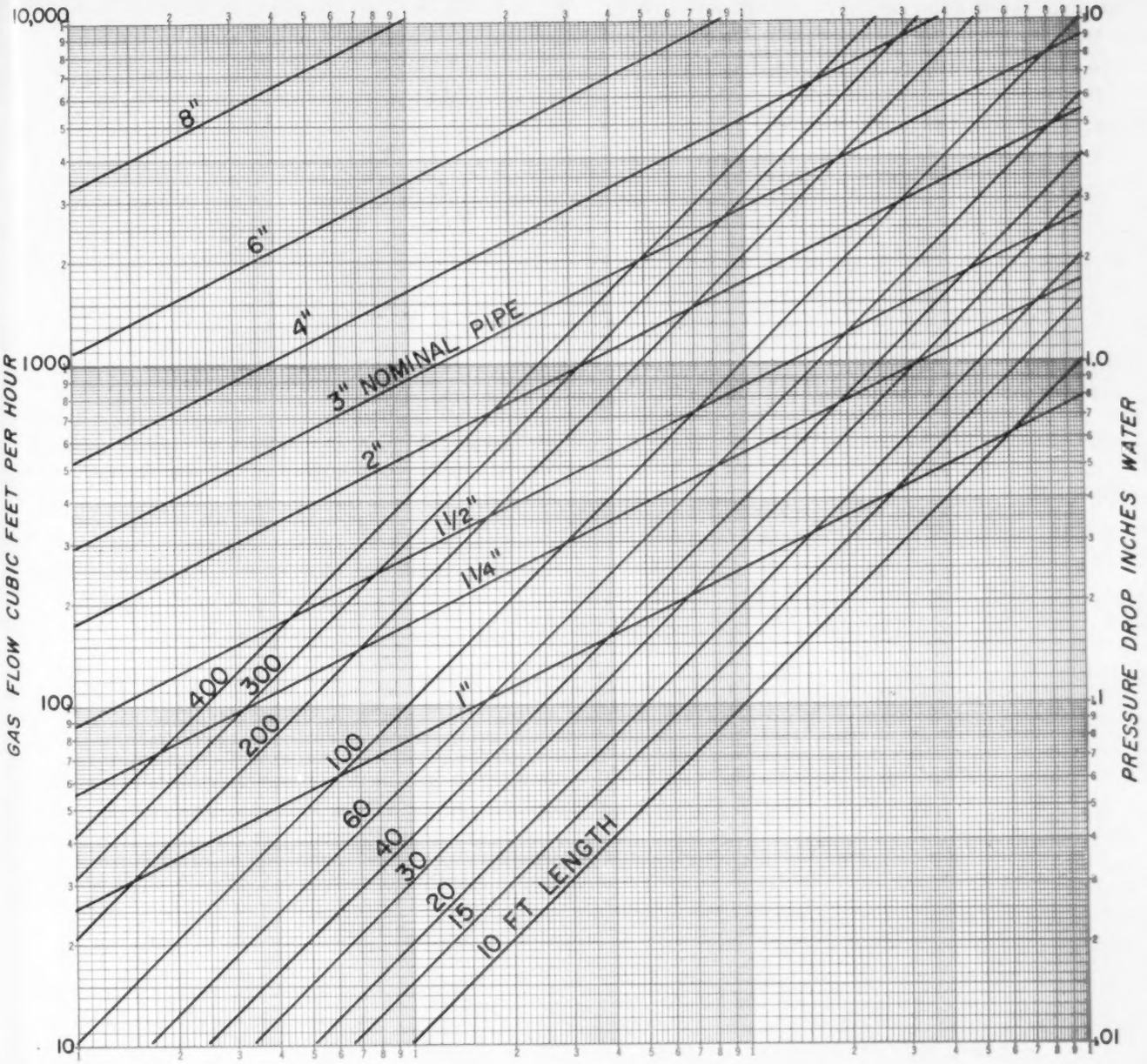
$$ED = \left(\frac{\text{inside diameter of pipe used}}{\text{inside diameter of a 1-in. pipe}}\right)^{5/2}$$

Nominal pipe size, in.	Inside diameter, in.	ED Value
⅜	0.493	0.15
½	0.593	0.27
¾	0.786	0.55
1	1.049	1.0
1¼	1.380	1.9
1½	1.610	2.9
2	2.067	5.5
2½	2.469	8.5
3	3.068	14.6
4	4.026	28.8
6	6.065	80.0
8	8.071	164.0

How It Works

Designs based on the above procedure offer advantages to both the designer and system owner.

For the designer, the use of ED values, Step 6, allows a quick "rough in" of the sizes for the main sections of line, without any possibility of undersizing short sections of line



Flow graph is based on Spitzglass Low Pressure formula, where $Q = 3550\ K\ (h/SL)^{1/2}$. (See AGJ Gas Handbook Issue, August 15, 1960, page 23.)

near the source. Because relatively low pressure drops occur in the main sections, the designer may often have a choice in selecting the size of the branch lines, Step 9. Here future needs and other considerations may determine the selection. The possibility of making mistakes in sizing is reduced because — after a size is found in Steps 5 or 6 — the selection is checked when pressure drops are determined in Steps 8 or 9. Main line sizes, as well as branch line sizes, can be re-adjusted in this manner.

For the system owner, the relatively low pressure drops in the main sections generally allow small additions to be made to the system without affecting sizes in the main sections. If additions should require increases in line sizes, the size changes can usually be made in the branch lines, and this work is often easier and cheaper than main line work.

Additionally, pressure fluctuations at the points of usage, when caused by intermittent operation of other equipment, will be held to a minimum by using main sections with relatively low drops.

Should the designer or system owner feel that the relatively large main sections are not justified, the above procedure, by showing actual pressure drops in each section, enables the designer to quickly re-examine the entire system.

Specific Gravity Correction Factors For Use With Flow Chart

(Based on sp.gr. = 0.60)

Specific gravity	Correction factor
.50	.92
.55	.96
.60	1.00
.65	1.04
.70	1.08
.75	1.12
.80	1.16

For gases having a specific gravity other than 0.60, multiply the cubic feet of gas required by the correction factor to find design gas requirements.

Example Design Using Procedure

Assume the designer wants to find the line sizes for the system shown in Fig. 1, without exceeding a pressure drop of 0.3 in. w.c. Steps 1 through 4 — plan, lengths, gas requirements, and lettering — are given in Fig. 1. We can begin with Step 5, using the chart:

Select the smallest size line from the sources to each point of usage, that will have less pressure drop than 0.3 in. w.c.

Point of usage	Line supplying point of usage	Line length ft	Gas usage, cfh	Nominal size selected, in.
C	ABC	35	3500	3
E	ABDE	50	3000	3
F	ABDF	240	100	1¼
H	ABGH	130	300	1½
J	ABGIJ	260	2000	4
K	ABGIK	320	1000	3

Show the size selected at each section of the line from the source to the point of usage:

	Section of line									
Line	AB	BC	BD	DE	DF	BG	GH	GI	IJ	IK
ABC	3	3	—	—	—	—	—	—	—	—
ABDE	3	—	3	3	—	—	—	—	—	—
ABDF	1¼	—	1¼	—	1¼	—	—	—	—	—
ABGH	1½	—	—	—	—	1½	1½	—	—	—
ABGIJ	4	—	—	—	—	4	—	4	4	—
ABGIK	3	—	—	—	—	3	—	3	—	3

In Step 6, find the smallest single equivalent size needed for sections where two or more lines were determined in Step 5. This is done by assigning each of the various lines its ED value from Table 1 and using the sum of the ED values to determine the nearest larger nominal pipe size:

	Sections							
	AB		BD		BG		GI	
Line	Size	ED	Size	ED	Size	ED	Size	ED
AB	3	14.6	—	—	—	—	—	—
ABD	3	14.6	3	14.6	—	—	—	—
ABD	1¼	1.9	1¼	1.9	—	—	—	—
ABG	1½	2.9	—	—	1½	2.9	—	—
ABGI	4	28.8	—	—	4	28.8	4	28.8
ABGI	3	14.6	—	—	3	14.6	3	14.6
Total ED		77.4		16.5		46.3		43.4
Nearest larger nominal pipe	6		4		6		6	

In Step 7, find the gas required at each connection in the system:

Connection:	I	G	D	B
Point of usage supplied				
C	—	—	—	3500
E	—	—	3000	3000
F	—	—	100	100
H	—	300	—	300
J	2000	2000	—	2000
K	1000	1000	—	1000
Total cfh	3000	3300	3100	9900

In Step 8, begin at the source and, from the chart, find the pressure drop in each section of line for which the size was determined in Step 6 and the gas required in Step 7:

Section	Length ft	Nominal pipe size, in.	Gas req'd., cfh	Actual pressure drop, in. w.c.
AB	20	6	9900	.02
BD	20	4	3100	.02
BG	100	6	3300	.02
GI	100	6	3000	.01

Find the pressure drop at each connection by cumulating the pressure drops in the various sections:

Connection	Pressure drop, in. w.c
B	.02
D	.04
G	.04
I	.05

In Step 9, determine if the size of the branch section can be reduced without exceeding the design pressure drop:

Branch Section:	BC	DE	DF	GH	IJ	IK
Point of usage supplied	C	E	F	H	J	K
Length, ft	15	10	200	10	40	100
Gas required, cfh	3500	3000	100	300	2000	1000
Size selected in Step 5	3	3	1¼	1½	4	3
Actual pressure drop, in. of w.c.	.08	.04	.07	.02	.02	0.4
Connection supplying branch section	B	D	D	G	I	I
Allowable pressure drop in branch, in. of w.c.	.28	.26	.26	.26	.26	.25
Smallest size line having less than allowable pressure drop	2½	2½	1¼	1	2½	2½
Pressure drop, in. of w.c., (from chart)	.25	.13	.17	.16	.22	.14

Since the actual pressure drops were less than the allowable, the sizes determined in Step 9 would be used as the final design. * * *

"Lady, I'm from the gas company," says B. E. Harrell, Arkansas Louisiana Gas Company vice president-gas supply, sales and sales promotion, to Mrs. Kermit Merrill, one of Arkla's new Wichita customers formerly served by Consolidated Gas. He sold Mrs. Merrill two gas lights during this call — part of a door-to-door canvass.

Arkla Gas Caravan salesmen Carlos Shell and Fred Gresham sported straw "skimmers" and carnival-barker canes to help put everyone in an enthusiastic carnival mood. (NOTE: They're among leaders of Arkla employee-salesmen team. Regular duties: Shell is manager of the Texarkana gas distribution district; Gresham is a gas distribution manager in Arkansas division.)

Ark La Gas Comes To Wichita

Carnival Atmosphere Wows 'Em, Gas Sales Caravan Sells 'Em

B. E. Harrell, *Vice President, and Sales Promotion, Arkansas Louisiana Gas Company, Shreveport, Louisiana*

Some of the elements of the old-fashioned carnival side show were injected by Arkansas Louisiana Gas Company into a recent all-out sales campaign, with noteworthy results both in terms of gas appliance sales and customer good will.

The "Arkla Gas Sales Caravan" involved a "tent" display of gas appliances in downtown Wichita, Kansas, and door-to-door canvassing. Purpose of the whirlwind six-day campaign, which had previously been kept secret from the public, was to introduce Arkla to 11,000 new customers and focus their attention on gas appliances, gas service, and the various products manufactured by company subsidiaries.

The Shreveport, Louisiana, and Little Rock, Arkansas-based gas company now serves some 90,000 former Consolidated Gas Utilities Corporation customers in its new Oklahoma-Kansas Division, formed when a merger of Consolidated into Arkla became effective August 31. These include 11,000 new customers in Wichita, where the Gas Service Co. also has nearly 90,000 meters.

Some 50 top employee-salesmen from the five-state Arkla area formed a team of door-to-door canvassers whose aim was to visit all 11,000 new Wichita customers. They wound up by calling on most of them with a brief, friendly introduction to "your new gas company" plus a sales pitch for gas lights, gas air conditioning, ranges, and other products. Helping lead the drive was W. D. Bright, director of small appliance sales.

Carnival atmosphere at the Arkla Gas Caravan tent help attract many visitors in downtown Wichita. Gas lights, gas signs, air conditioning units, ranges, and other products were on display. Brightly-colored flags, music, and use of "skimmer" or "katy" hats and carnival-barker canes and general enthusiasm by Arkla sales people contributed to the campaign's success.

"Tent Show" Draws Crowds

A carnival atmosphere prevailed at the Arkla tent, which was pitched on a parking lot at the corner of Wichita's First and Main Streets and was open from 7:30 a.m. to 6:30 p.m. daily. Various gas lights, gas air conditioning units and heaters, gas signs, ranges, dryers, refrigerators, furniture, fiberglass pleasure boats and other products sold by the gas company or made by subsidiaries were on display. Two home service representatives were on hand to sell and demonstrate gas appliances and furniture.

Decorations included brightly-colored flags, and lively music was played over a loudspeaker. Arkla Gas sales people wore straw "skimmer" or "katy" hats, complete with carnival-barker canes. Hundreds of free buggy rides were given in a carriage made by an Arkla subsidiary.

Three Arkla "Gaslites," a clothes dryer and two built-in gas ranges were given away at a drawing following the Caravan.

Team Effort Gets Results

The campaign was a team effort throughout. Personnel included town managers and other employee salesmen. Sales teams held a breakfast meeting early each morning at Caravan headquarters in the gas-air conditioned Lassen Hotel to plan strategy for the day. Teams reported sales daily at the former Consolidated Gas office, now the Arkla gas office at 109 South Main. These reports were relayed to salesmen the next morning at breakfast, and tips on how further sales might be made were given by Caravan leaders.

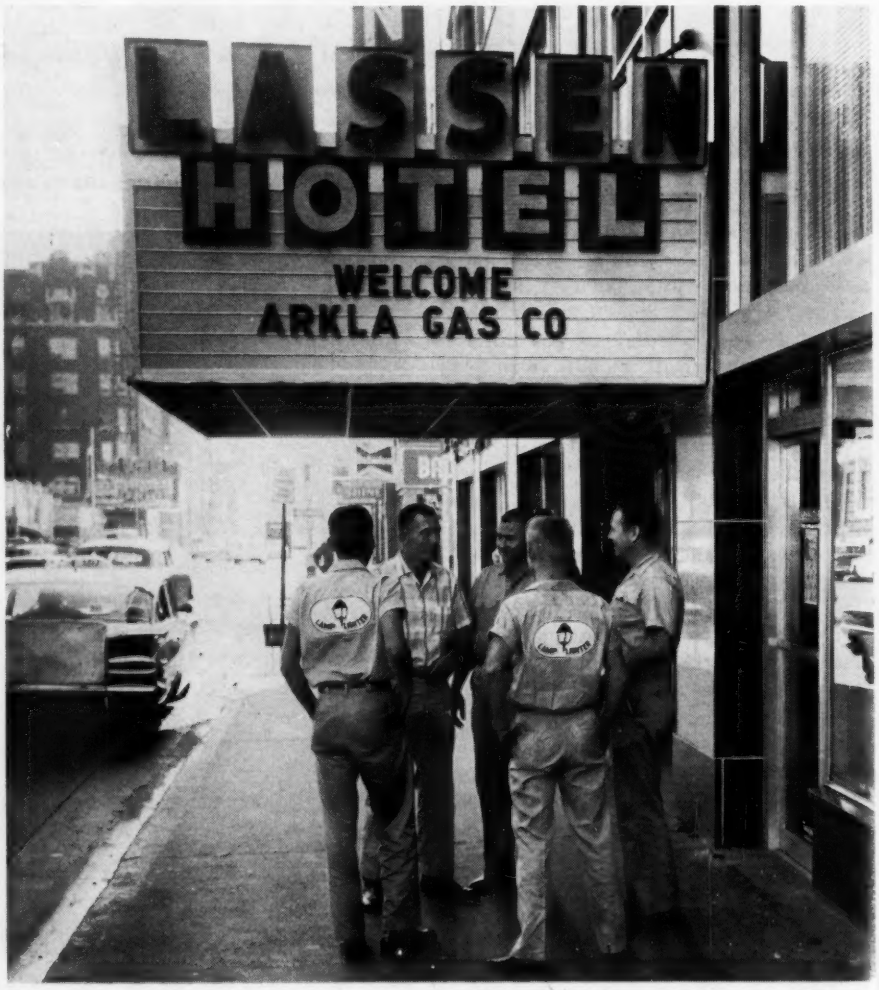
Results of the campaign demonstrate the effectiveness of this kind of hard-sell effort. Sales during the six-day campaign included:

540 gas lights,
125 gas built-in ranges (mostly to builders),
10 Arkla Sun Valley gas air conditioning units,
15 Arkla "Gasigns" (lease-sale),
4 gas clothes dryers, and
1 combination washer-dryer,
plus over a score of Razorback fiberglass boats, furniture and other Arkla subsidiary-made products.

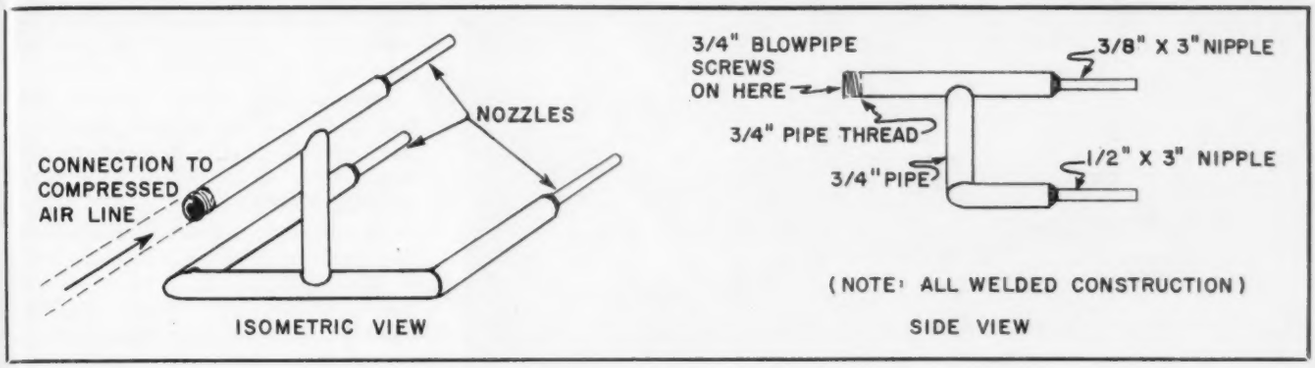
Many of the appliances were financed with payments on customers' new Arkla gas bills.

So successful was the Arkla Gas Caravan in Wichita that the company held a similar promotion in Little Rock several weeks later which netted these sales: 307 "Gaslites," 18 "Gasigns," 13 gas ranges, 4 Arkla-Humphrey gas circulators, 5 gas dryers, and other products. Additional Caravans may be held in other cities on the Arkla system. * * *

New Arkla "Gaslite" goes in at a Wichita customer's home — a fast follow-up to a sale made by the Arkla Gas Sales Caravan. The installation crews also did their share of the selling during the 6-day campaign, which resulted in sales of 540 gas lights and scores of other products.



Team of "Arkla Lamplighters" who installed gas lights and other gas appliances sold during the Gas Sales Caravan plan the day's work under the marquee of the Lassen Hotel, Caravan headquarters. The hotel is gas air conditioned, and is one of Arkla's new gas customers in Wichita.



IDEAS AT WORK

New Air-Powered Driving Head Helps Reduce Jacking Costs

Frederick H. Abrew, *Long Island Lighting Company, Mineola, New York*

A NEW TOOL for use during pipe jacking operations that puts air to work more efficiently, has been developed by George Streib, Mechanic "A," with the underground lines and main department of Long Island Lighting Company.

Streib, who was awarded $100 for his imaginative efforts through the company's suggestion program, developed the idea while working on a crew that experienced a great deal of difficulty while jacking a section of 8-in. steel pipe under a roadway.

The jacking operations were being performed with a standard hydraulic pipe jack mounted on a steel rail, with a ¾-in. blowpipe inside the pipe. Inability of the single ¾-in. blowpipe to break up the soil in front of the 8-in. pipe led to development of the new jacking head.

Streib, with the assistance of Frederick Kaan, foreman in the same department, designed a three-nozzle blowpipe head through which compressed air is forced to loosen and move soil in the path of the pipe being jacked.

Basically, the new jacking head consists of three blow pipes interconnected with piping in the form of an inverted "T" *(see drawing)*. The entire assembly is then connected to a single air line by means of a coupling at the top of the jacking head. The two bottom nozzles are constructed from ½-in. pipe and the top nozzle is made of ⅜-in. pipe. All other connecting pipe is ¾-in.

Although the original blowing head was constructed completely from screwed fittings, subsequent models

Three-pronged attack. George Streib, left, demonstrates new three-nozzle blowpipe device used in "jacking" pipe under roadways. At right is Fred Kaan, foreman who assisted Streib in developing the driving head.

360,000 Square Feet of working space are provided in the new Youngwood Plant of Robertshaw Thermostat Division, located on a 267-acre site adjacent to the Pennsylvania Turnpike. Entire plant is gas heated, offices are completely gas air conditioned.

Robertshaw Thermostat's Youngwood Plant Designed For Efficiency, Expandability

Near Youngwood, Pennsylvania, a new $4,000,000 plant, designed for efficient, economical production of controls for gas appliances, has been officially opened by Robertshaw-Fulton Controls Company, one of the nation's leading manufacturers of domestic and commercial controls.

Symbolizing official opening of the new Robertshaw Thermostat Division plant near Youngwood, Pennsylvania, was lighting of a gas lamp at the edge of a large reflecting pool in front of the new $4,000,000 structure. Doing honors at top left is Christy Payne, Jr., Consolidated Natural Gas Company. Clasping Payne's hand (right) is Thomas T. Arden, president of Robertshaw-Fulton Controls Company. In foreground, left to right, are Harold Walker, assistant to the managing director, American Gas Association; Frank Hodgden, managing director, A.G.A. Laboratories in Cleveland; George Coulter, Manufacturers Light and Heat Company; Frank Post, vice president of Robertshaw-Fulton and general manager of the Thermostat Division, and Gilbert Smith, Equitable Gas Company, Pittsburgh.

Home of the Robertshaw Thermostat Division, the new plant is located on a 267-acre site along the Pennsylvania Turnpike near the new Stanton Interchange. Under roof are 7½ acres, with 284,000 sq ft of manufacturing arranged to obtain the utmost efficiency of operation.

Exterior of the new facility is a blend of anodized aluminum, glass, and brick. Offices are completely gas air conditioned, and both offices and manufacturing areas are gas heated.

A waste treatment plant is completely integrated into the operation. Toxic waste is handled effectively by a combined acid-alkali neutralization system, coupled with a complete cyanide destruction system using pressure filtration to remove solids. This is only the second industrial waste treatment plant of its type in the state of Pennsylvania. The other is at Robertshaw-Fulton's Indiana Division at Indiana, Pennsylvania.

Architecturally, the plant has been designed as an efficient, pleasant place for 1500 people to work. The plant has also been designed for expandability to keep pace with the company's projected growth over the next 10 years. A two-story office building provides space for the general offices, home economics, and engineering departments. A modern plant cafeteria where 250 persons can be served at a time is also provided.

In the manufacturing portion of the plant, of one-story construction, clear spans of 40 ft by 100 ft and 8-ft aisles provide an open, airy atmosphere. Manufacturing flow moves counterclockwise around a U-flow production system. * * *

have been of welded construction to reduce the bulkiness of the jacking head and thus increase its effectiveness.

Basic design theory behind the jacking head is the dynamic force exerted on a flat plate. Because the dynamic force is dependent upon both the area of the jet stream and its velocity, it is possible to increase or decrease this force by altering either or both of the quantities. It is more advantageous to alter the velocity since the force is dependent upon the square of the velocity.

The jacking head increases force on the soil by reducing the outlet piping size with a resultant increase in the velocity of the jet air stream. And, by using three nozzles, a greater coverage on the soil in front of the pipe is obtained. These two factors will, in most cases, greatly reduce the time necessary to make a particular pipe "jacking."

As with any new development, the jacking head has certain inherent disadvantages. Prime among these is the fact that the tool is bulky and, consequently, offers quite a bit of resistance to the spoils blowing back from the front of the pipe. In a rocky soil, some degree of difficulty may be experienced with rocks that tend to become lodged in the head.

Time Savings

The following example serves to illustrate the success that Long Island Lighting Company has enjoyed while using Streib's jacking head.

In two recent pipe jacking operations, in which similar difficult jacking conditions existed, one five-man crew required six working days to force 28 ft of 8-in. pipe under a roadway using the existing standard jacking equipment and procedures.

A second five-man crew, using Streib's new device, was able to jack 56 ft of 8-in. pipe in only five working days.

In both cases, one full working day was required to excavate the jacking pit and set up the equipment, at a labor cost of $130.

Actual jacking costs in the first case (standard equipment and procedure) amounted to five days at $130 per day, for a total of $650, or a cost of $23.20 per ft.

In the second case, (using Streib's device) only four days was required for actual jacking, at $130 per day, for a total of $520 or a cost of $9.30 per ft.

A contractor who installs a considerable amount of new pipe for the company has also experienced similar time savings and gains in footage produced per day while jacking pipe with the new device. * * *

Price Regulation of Gas From Field to Burner Tip: *Here to Stay?*

AGJ Staff Report

Federal regulation of independent producers — and field prices of natural gas — may never be completely eliminated but there is hope for some decontrol and improvement in pricing methods, a three-man panel representing producer, pipeline, and distributor interests told the annual meeting of the Independent Producers Association of America at the group's annual meeting in Dallas.

Highlighted at the meeting were these points:

- Area-pricing, recently announced by the FPC, is a step in the right direction and might be the basis for a generally acceptable form of regulation.
- Because the distributors must sell consumers and regulatory bodies on the idea, any new method must be satisfactory to them.
- Regulation of producers will never be completely eliminated; some type of regulation involving field pricing of gas will continue to exist.

Members of the panel — W. J. Goldston, president of the Mid-Continent Oil & Gas Association; W. M. Elmer, president of Texas Gas Transmission Corporation, and J. Theodore Wolfe, president of Baltimore Gas & Electric Company — are also members of a "harmony task force" that has been working for nearly two years to promote a better understanding among producers, pipelines, and distributors and, eventually, agreement on new legislation.

The harmony group, reported all three panel members, has progressed considerably in achieving a mutual understanding of each other's problems. But much work remains to be done, including the drafting of proposed new legislation that would be fair and equitable to all parties, including consumers.

In brief, here's what the panel members said:

Producer's Viewpoint . . .

W. J. Goldston, president, Mid-Continent Oil and Gas Association

For more than six years producers have been "floundering in a morass of uncertainty and a jungle of red tape," Houston producer Goldston told the IPAA meeting. In that period, he added, there have been times when it seemed that considerable progress was being made toward reaching a solid footing of a workable solution, but all too often nothing happened. He compared the efforts with the frog in the fable who "slipped back three steps for every two steps of progress."

Goldston pointed to one heartening sign in the progress made by all three segments of natural gas toward a better understanding of each other's problems. This, he declared, holds a real promise of a solution that will be fair and equitable to all — producers, pipelines, distributors, and consumers.

Solution urgently needed. Events of recent weeks, Goldston said, have not changed the basic situation nor have they done away with the need for corrective legislation. Without it, he asserted, there are doubts that natural gas can enjoy the growth of which it is capable.

Panelists Elmer (left), Goldston, and Wolfe (right) discuss industry problems at IPAA meeting in Dallas.

Most crucial problem facing the producer, declared Goldston, is the need for maintaining adequate economic incentives for finding and developing the tremendous supplies of new gas that will be required to meet expanding demand. He pointed to the major obstacle in finding a solution to this problem as being the unworkable, unwise, and unrealistic federal regulation of gas producers.

Since June 7, 1954, said Goldston, an "economic sword of Damocles has been hanging over the producer's head," referring to utility-type or cost-of-service regulation.

Area pricing not a permanent panacea. While the FPC's decision in the Phillips Case and its new policy of area pricing have certain favorable aspects, said Goldston, area pricing cannot be considered a permanent and complete solution of the industry's pricing problems.

As an example, he noted the FPC recognized there are fundamental differences between the gas producer and the other two segments. In the Phillips Case opinion, the FPC said: *"Producers of natural gas cannot, by any stretch of the imagination, be properly classified as traditional public utilities."*

Another favorable feature, according to Goldston, is that these developments represent "action rather than inaction," and constitute a positive attempt to arrive at a workable solution. In place of *ad hoc* or case-by-case approach, the commission is seeking to establish a uniform method of determining producer prices.

Goldston pointed out two other significant commission actions — it did not rule out some type of escalation clause to protect the producer against uncertainties of the future,

and it held that gas plant operations are non-jurisdictional.

He noted that the FPC, while giving considerable weight to commodity value, plans to make use of cost data obtained in the past and that it intends to acquire and consider cost information in the future. He termed this a reasonable approach.

Delay is deadly. Even taking the most optimistic view, and assuming that the courts will uphold the area price policy, Goldston believes that a final decision will come only after interminable delays, legal harassments, and judicial uncertainties. "And the industry can ill afford another period of uncertainty of the kind it has been subject to since 1954," he declared.

Price freeze? The area pricing method raises the danger of a price freeze at or near the levels recently set by the FPC, said Goldston, even though the commission has said that it will consider exceptions from area price levels and will consider the economic requirements of the producing industry in determining further price levels.

"Procedures forced on the producer to accomplish this could easily become cumbersome and so complicated and involved that the net effect would be to hold back any change in price levels," he emphasized, "and the net effect, once again, would be to weaken incentives for development of new interstate supplies."

The sanctity of contracts. Goldston pointed out that no provision was made in the FPC pronouncements, in either the Phillips case ruling or its policy statement, for approval or disapproval of contracts.

"In my opinion," he said, "a contract — once freely entered into by two or more parties and once approved by the Commission — should be binding on these parties. Should a contract not be approved . . . then all parties should be released from their obligations under the proposed contract."

"Arbitrary action of an outside agency should not bind people to things they have not agreed to," he stated. "This concept . . . sanctity of contracts . . . cannot be destroyed or weakened without doing tremendous damage to the future growth of the producing industry."

Goldston said that such matters as price of a product and the terms of its delivery are and should be contractual items . . . and once price and delivery terms have been agreed to and approved, they should not be subject to arbitrary or unilateral changes.

Short term contracts? The Houston producer said he thought that if two parties could get together on a short-term contract of 5 to 10 years duration, there should be no legal or administrative barriers to their entering into such a contract.

"I would rather sell gas, either interstate or intrastate," he said, "at an initial 14 cents per Mcf on a 10-year contract than I would for 18 cents on a 20-year contract."

Goldston said he thought many interstate pipeline purchasers were missing a bet by insisting on long-term contracts for all their gas.

A long road ahead. Goldston told the meeting that the progress made recently in industry relations, FPC actions, and other areas should not lead to a false sense of security. Instead, he declared, efforts must be continued to press for adequate and proper legislative relief . . . an amendment to the Natural Gas Act to consolidate through legislation the progress made to date and to resolve the remaining knotty questions.

Summarizing, Goldston pointed out specifics that must be considered:

1. The producer has to know the price he is going to get for his gas.
2. He has to know that his contract price, once approved, is a definite price.
3. He wants to know just how much gas he is contracting to sell.
4. He wants to know how long he will be required to make deliveries under his contract.
5. If he must sell gas under long-term contracts, he must have protection against inflationary trends.
6. Finally, the producer should not be expected to accept any method of pricing gas that does not include commodity value as a basic factor in the determination of price.

Pipeliner's Viewpoint . . .

W. M. Elmer, president
Texas Gas Transmission Corporation

The gas pipeline industry has experienced the bulk of its growth in the last 15 years. Last year, interstate gas pipeline companies marketed about 6½ trillion cu ft of natural gas—compared to about one trillion cu ft some 15 years ago. To bring that much natural gas to every state in the U.S., said pipeline president W. M. Elmer, has required an investment of about $16-billion.

With that expenditure—and a comparably large expenditure by the distribution companies—natural gas has been made available to the entire country, resulting in a marked effect upon the economics of natural gas production, Elmer pointed out.

Not too many years ago, he said, gas sold in Texas and South Louisiana for 3 and 4 cents. Today, new contract prices are near 22 cents.

If the distribution companies had not pushed their product—natural gas—and built facilities to sell it, neither the producers nor the pipeline companies could have achieved this large growth.

Pipeline companies find themselves as a link between two equally important segments of the industry. "I want to emphasize that 'equally important' . . . too many distributors think that we are playing 'footsie' with the producers . . . and too many producers feel we shouldn't consider the distributor on an equal basis," declared Elmer.

"But we must . . . and we do . . . for, without the distributors selling the gas, the producer couldn't market it," he added.

Intrastate markets. There are intrastate markets, said Elmer, but there aren't enough of them to absorb the growth in gas production or to provide the growth in gas sales that the interstate market can provide.

Pipeline operating economics. Elmer noted that some producers say "What are you worrying about? You pay the price, file your rate increase, you get your guaranteed rate of return, so you come out all right." But it's not that simple, he declared. "We have run into real problems . . . political pressure and consumer pressure. All three segments of the industry must work toward stabilizing the price of gas or we'll be facing more stringent regulation."

Guaranteed rate of return? Each time a pipeline company goes to the FPC for a rate increase, the commission staff makes every effort to keep that increase to a minimum, he observed. Very few pipeline companies in the past 10 years have recovered in increased rates an amount equal to their increased cost of gas. They may get a rate increase, but the commission staff has also pared it down to the bone, taking something away from the stockholders to keep the increase to a minimum.

This "paring" includes elimination from the rate base of such items as cash balances for credit purposes to meet lags and collections, and even eliminating everything except equity alone. The percentage of return on equity has been fixed at a rate much lower than what most companies have been making on their equity. This affects financing, because equity earnings serve as the base for financing. At the same time, capital costs keep going up.

Short term gas purchase contracts. A pipeline company,

pointed out Elmer, finances primarily on senior debt, i.e., bonds. These bonds are paid off in sinking funds, for example, equal installments each year from the third year to the 20th. The payments are tied to long-term gas purchase contracts.

Without such long-term gas purchase contracts, he emphasized, financing of new facilities to take care of the growing needs of consumers and provide markets for new gas production wouldn't be possible. Some gas could be sold on short-term contracts, it's true. But, the bulk of the gas market's expansion must go into interstate commerce and this requires new facilities and accompanying financing . . . all dependent upon long-term contracts.

Offshore gas is expensive. The gas pipeline companies in the past 10 years have been able to maintain about the same cost of operation per Mcf delivered, he declared. They've done this by building larger diameter lines and improving efficiencies. Only the cost of gas has gone up.

With offshore gas, the problem is different. Offshore gathering lines cost about 3½ times as much to install as comparable lines on land. They also cost more to operate. For companies now buying offshore production, this means increased operating costs for the entire system.

Industrial sales. "We are pricing ourselves out of the market in some cases . . . especially the boiler fuel market for electric power generation," he said. In the Ohio and Mississippi Valley areas, coal can be brought in on barges, delivered to plants, and burned for about 20 to 21 cents per equivalent Mcf. "You can't compete for this market if you pay 21 cents for Gulf Coast gas plus 2 cents in taxes. We'll lose this market, but there are many other industrial markets more important to us where we can compete," he added.

The price of gas. The pipeline companies and the distributors both know what it is costing to find gas. They know it is costing more and more. They want producers to have an incentive to find gas . . . to find it on a profitable basis . . . to take care of the growing needs of the nation.

"But today there are 32,000,000 homes in this country using natural gas. That's a lot of votes. That's a lot more people than all the employees and stockholders of the entire natural gas business. We have to be realistic in looking at this problem of natural gas prices," he emphasized.

It's not likely we will ever be able to free ourselves completely from all government regulation, observed the pipeline company president. There are too many people who would like to see government regulation of all the utilities they use in their homes — water, electricity, and gas.

Area pricing. "I think it's great that the FPC has finally recognized what we've been telling them for years . . . that the utility-type rate base, cost-of-service-type regulation is unworkable for the producer," he declared.

"The area pricing approach appears the most workable method of regulating the field price for the producer. I'm not endorsing the prices they have announced. Many are too low, some unreasonably low."

Legislation. Any new legislation should have three basic points, said Elmer. "First, it must make crystal clear that, under no conditions, can the independent producer be regulated on a utility-type cost-of-service, company-by-company basis. Second, a basis for pricing must provide an incentive for producers to seek, discover, and develop gas reserves the country needs for the future. Third, gas prices need to be stabilized . . . not frozen, but stabilized . . . to keep from having rate increases every few months. As part of this, we will have to get rid of indefinite pricing clauses."

Distributor's Viewpoint . . .

J. Theodore Wolfe, president, Baltimore Gas & Electric Company

To understand the problems of natural gas, it is necessary to know something about how it works, emphasized Wolfe. In the U. S., he noted, there are distinct segments:

1. **Some 8000 producers,** most of whom produce both oil and gas, who sell over half of their gas production directly or indirectly to . . .
2. **About 125 interstate pipeline companies,** who purchase gas in the field and in turn sell it to . . .
3. **More than 1200 distribution companies and municipalities,** who distribute it to . . .
4. **Approximately 32,500,000 residential, commercial, and industrial consumers** in nearly every state of the union.

Such a huge operation is also a complex operation, he noted. Many producers of natural gas also produce oil . . . and some oil products find their way into competition with gas at the retail market level. Some interstate pipeline companies sell gas directly to industrial customers, at times in competition with the customers — the distribution companies. A substantial number of distribution companies are also in the electric business, which competes not only with natural gas but also with oil and LPG, a byproduct of the oil and gas business.

"Any industry so large and so complex," he pointed out, "is bound to have problems. These problems can be dealt with effectively only if they are recognized and understood by all segments, and only if the solutions are designed to meet the needs of all segments."

Wolfe told the meeting that the two most pressing problems of natural gas today . . . and in years to come . . . are:

1. *The need to develop and maintain an adequate supply of gas, and*
2. *The need to sell this gas in face of increasing competition from other forms of energy.*

"The two problems are interrelated," he stated, "as are the interests of producers, pipeliners, and distributors of gas. If we meet them successfully, we shall all prosper; if we fail to meet them we shall all suffer."

Basic problem of the gas distributor is an economic problem. In relation to the annual volume of his business, noted Wolfe, the distributor is obliged to make a relatively heavy fixed investment to supply his customers with gas. This investment ranges from $2 to $3 for each $1 of his annual revenue. This investment is mostly in facilities that are usable only for the distribution of gas — pipe, valves, regulators, meters — and which become useless if gas is not available or cannot be sold.

Total fixed investment of the gas distribution industry is about $16-billion. In addition, the industry's more than 32,000,000 customers have an investment of their own of about $10-billion in appliances that use natural gas.

A second part of the problem, he added, is that the gas distributor is obliged to make long-term commitments for specified quantities in purchasing natural gas from a pipeline company . . . with no knowledge of what the price will be over that entire contract period, usually 20 years.

These 20-year commitments are required by the pipeline company to support its investment in pipeline facilities.

The distributing company must pay whatever price is provided in the service tariff of the pipeline company, which is, of course, subject to regulation by the Federal Power Commission.

With a combination of economic conditions pointed out — heavy investment in distribution facilities, long term purchase commitments, and no price commitments — it is easy to see that the distributors are in somewhat of an uncomfortable position, declared the Baltimore gas executive.

Several collateral factors tend to make them feel even more uncomfortable, he pointed out.

First, they are bound to recognize that some of the people who produce gas also produce oil . . . and sell it in competition with that gas.

Second, they are unable to participate directly in negotiations as to the price to be paid for that gas in the field. Sometimes there are up to four middlemen — pipeline companies — between them and the producer who sells gas in the field.

Third, they are aware of the rapid and seemingly uncontrolled rise in the cost of gas during the past 10 years by as much as two-thirds at the city gate where the distributor takes his gas from the pipeline company.

Gate prices of gas. Not every pipeline company has been able to keep its operating costs down, Wolfe said. Investment in new facilities at high construction costs, increases in labor costs, etc., have caused some pipeline costs to go up.

Most obvious factor contributing to a two-thirds increase in the city gate costs of natural gas over a 10-year period has been the rise in field prices. The average field price has gone up from somewhere around 6 to 8 cents per Mcf in 1950 to about 14 cents in 1959. The average rise, though, is not entirely indicative of what has happened, said Wolfe, because new contracts have entered into the prices in the area of 20 to 24 cents per Mcf, and these new contracts have had a disproportionate effect on the price of gas at the city gate in eastern seaboard states.

Field price is minor? It is all very well for producers to say that what they get for gas is only a minor part of what the ultimate consumer in the retail market has to pay for it, but the facts of life as they exist at the retail market at the end of the pipeline must be recognized, he emphasized.

There are a lot of costs involved in the distribution business that producers don't have to worry about, Wolfe said, but they should understand them. They explain why gas that sells for 14 cents per Mcf in the field has to sell for $2.33 in a large eastern city.

Briefly, outlined the speaker, here's why this tremendous spread exists in prices:

In the eastern city used as an example, the average retail sale price for firm gas in 1958 was $2.33 per Mcf.

The cost of gas to the company in this city is not 14 cents, but was 78 cents per Mcf when it reached the company. Costs of distribution to support the heavy investment made in lines in the streets of this city run to about 30 cents. The company has to provide services to customers on their appliances . . . because it is traditional and necessary . . . and the cost of these services is about 15 cents per Mcf.

The company's total operating costs are $1.73 per Mcf. That leaves 60 cents per Mcf out of $2.33 charged to the customer. Operating costs don't include taxes, so 44 cents must be deducted — for taxes — from the remaining 60 cents. Another 3 cents goes for other deductions.

This leaves the distributor with 13 cents per Mcf, which he rather euphemistically calls the profit on his gas business.

Out of $2.33, he has 13 cents left.

"If you relate that 13 cents to the capital he has invested in his business," declared Wolfe, "you find he has a return (which isn't even enough to be dignified by the term rate of return) of a little under four percent."

Field prices are important. Wolfe noted that some producers feel that, when gas is selling at $2.33 per Mcf, another 10 cents per Mcf charged in the field won't hurt. But it would, he said, and it has the distributor worried. Theoretically, it wouldn't hurt him if he could just pass it on to his customers, but there are quite a few reasons why he can't readily do that.

One of them is the strenuous and increasing opposition by regulatory bodies against increases in retail rates.

Another reason is that distributors have serious competition. This competition comes from three directions. Competition is coming from oil; competition is coming from electricity; competition is coming from coal.

While gas is selling at anywhere from 30 to 50% below oil in terms of cost per million Btu's in some parts of the country, it is also selling at prices substantially above the price of oil in other parts of the country.

Competition from electricity is going to be the real competition for the oil and gas industry in the future. Up to now, that competition has had its impact on such energy uses as cooking, water heating, clothes drying, and refrigeration, but electricity is drawing a bead on the residential heating load, and it has some pretty strong ammunition. The big reason is excess generating capacity in the winter months. Electric utilities are plagued with peak loads on their systems in the summer months because of air conditioning. They are going to try desperately to get away from summer peaks by selling electricity for heating.

Competition for gas distributors comes also from the coal industry . . . not only from the threat of legislation to take away part of the gas industrial markets, but also from increasingly intensive and commendable effort by the coal industry in the field of research to improve the utilization of its product. The coal interests have a new determination to get out and sell again, as they haven't done for a great many years.

The forces of competition. Gas distributors are just as strong for free enterprise as are gas producers or pipeliners, Wolfe told his audience. Although they are accustomed to regulation themselves, they would generally endorse the proposition that, except in periods of emergency such as wartime, the government should not regulate prices where the forces of competition operate freely.

But so far as their purchases of natural gas are concerned, the forces of competition do not operate freely, he asserted. Maybe they do down in the field, but not at the point where the gas distributor makes his purchases. He can buy gas only from the pipeline company or companies certificated by the FPC to serve him. Without regulation, he has no voice in the prices paid for gas in the field. Distributors feel that some form of regulation of these prices is necessary for the protection of their investments and of the consumers.

Gas distributors recognize that exploring for, development of, and production of natural gas is not a public utility function. They generally agree that it cannot effectively be regulated as a public utility function.

Most of them would go along with some form of control over field prices that would free producers from the burden of public utility-type regulation, provided it also assures them — the distributors — that their own interests and those of their customers will be reasonably well protected.

"There is still a question among some of the distributors as to whether or not legislation is needed to permit the kind of field-price regulation under which producers, pipeliners, and distributors alike can live," he added.

In departing from the rate-base, cost-of-service approach and establishing tentative area price guides for regulation of new and old contracts, the FPC justified its action under present law, Wolfe feels, but he indicated that years of litigation may be ahead before it is sustained in the courts.

Because of this, legislation itself is highly desirable and probably necessary. It goes without saying that any legislation to be enacted must have the widespread support of all segments of the natural gas business. And it must be of a nature that will permit the distribution companies — who really have to be the No. 1 salesmen on it — to persuade public officials and regulatory bodies that it is in the interests of the ultimate consumer.

"The exact form of such legislation is not yet clear," he noted. "But it would be unrealistic to go back to the pre-1954 days of complete exemption, just as it would be unrealistic to try to regulate producers as though they were public utilities, which they are not. Something in between complete exemption and regulation as a public utility is the probable answer." * * *

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Cathodic Protection Can Be Funny!

Herbert C. Van Nouhuys, *Consulting Editor*

The above caption should be qualified by the remark that, to those most directly concerned in the following three cases, cathodic protection appeared anything but funny at the time.

These three cases involve a bathtub, a fence, and a mule.

● The *Bathtub Case* concerns a pretty young wife who complained to her husband that she felt a shock upon taking a bath. Her husband chided her good-naturedly and even got his parents who lived in the opposite end of the house with a separate bath, to affirm that they were not bothered with shocks in the bathtub at all, and she must be possessed of a good imagination or an unusually sensitive skin.

The young wife nevertheless stuck to her story, so the power company was called in to investigate. The power men found no a-c short, but did detect a small amount of d-c in the neutral, and knowing of a gas company rectifier installation about a mile down the road, called the company's maintenance department.

The corrosion engineer for the gas company took his voltmeter to the house and, so the story goes, was unable to convince the young lady to reenter the tub for the purpose of conducting a bonafide test of potentials between several critical points.

Notwithstanding this lack of cooperation, the engineer proved the point by measuring a potential of 8-v d-c between the spout and the drain. This voltage was quickly eliminated by placing a jumper wire between the supply and drain lines under the house.

A trip back to the rectifier revealed that lightning had caused a short across one end of a rectifier stack to the housing, allowing some d-c current to flow down the power line neutral, decreasing the ground bed output.

As a result of this experience, and other cases of rectifier stacks shorting to the frame, insulating strips of bakelite were installed at the ends of each rectifier stack. These were effective in preventing further shorts across stack end washers.

● *The Fence Case* concerned a large rectifier installation surrounded by approximately two miles of 4 strand barbed wire, stapled in most cases to trees rather than to dry fence posts. The ground bed extended about 1000 ft each side of the gas line, passing under the fence in one place and in close proximity for several hundred feet.

In these locations, tests with a d-c voltmeter indicated current to be flowing from the ground bed anodes into the tree roots, up the roots to the trunk, thence via the staple into the fence wires. This effect was negligible where dry fence posts were used.

After the current (which was a small percentage of the total rectifier output) had taken the fence path, it proceeded along the wires toward the gas line. Trees in the vicinity of two gas line crossings received the current via the staples, from the barbed wires and discharged it from the roots into the soil, back to the pipe line, thence to the rectifier negative, completing the circuit.

The rub to all this logical procedure being that, at the cathodic tree trunks near the pipeline, the wires and staples were anodes of thin dimensions that were soon dissolved by the d-c current . . . the wires fell to the ground, and the hogs got into the neighbors oats to the tune of $8 worth of damage. The gas company 'fessed up and paid the $8 — also put in a new fence "on dry fenceposts" for the farmer.

Current pickup and discharge to and from the lower fence strands, occurs when grasses and weeds are allowed to grow against the wire, also where the bottom wire is in contact with the soil. Flow is increased during wet weather. If considered essential to bury the wire along the bottom, it should be given two coats of heavy mastic coating.

● The *Case of the Mule* came to light when a farmer noticed that Old Jake acted strangely at the drinking pond, prancing about and lifting his head suddenly from the water. In dry weather he didn't seem to have so much trouble enjoying a long cool draught from this pond, located about 25 ft from the nearest anode of a 40-amp ground bed. By facing in the direction of current flux Old Jakes' electrodes, front and rear, spanned a potential drop (or IR drop) of probably 2 to 5 v, which tickled him in wet, good contact weather.

He probably discovered "by experiment" that by orienting himself so as to span points of equal potential, he was allowed more comfortable drinking conditions. In dry weather his contact resistance was great enough to preclude current flow through his internal resistance.

Whether Jake's internal resistance placed him in the category of a high or low resistance voltmeter was never determined. Providing him with rubber boots or a dry platform was considered, but proved unnecessary. * * *

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NEWS ABOUT CURRENT AND PLANNED CONSTRUCTION

Southern Counties Gas Company, Los Angeles, California, has recently acquired a new franchise to serve residents of Temple City with natural gas. Company is currently negotiating for a franchise in two newly incorporated cities of San Dimas in the eastern division and Grover City in the northern division.

Southern Counties also plans to install a new $76,000 gas distribution system to serve residents of La Chusa Highlands subdivision west of Trancas Beach. Approximately 17,900 ft of main will be required to serve the development; 5300 ft of this will be approach main along the highway, rest will serve to carry gas to the homes in the subdivision. Plans call for extension of the existing 6-in. main from its present western terminus near Trancas Beach, along the Pacific Coast Highway to a point about 3½ miles from the Ventura county line.

Union Gas Company of Canada, Toronto, Ontario, has just completed construction of a 10-mile system to supply gas to a new industrial area at Port Maitland, 5 miles south of Dunnville. Project involved installation of pipe of varying sizes up to 10-in. diameter, and boring beneath 12 sets of railways tracks. New system is "Y" shaped with one of the arms used to transmit locally-produced gas, and the second tieing in with the rest of the company's system near Dunnville. Gas from both lines flows into main trunk —10-in.—to the industrial area.

New York State Electric and Gas Corporation, Binghamton, New York, recently completed a new gas distribution system to serve the Village of Trumansburg. More than 200 services to customers' homes have been installed and are awaiting connections to the meters. Another 300 services currently are being installed. Supply line to serve the village runs along the Trumansburg Road, through the Hamlet of Jacksonville, to Trumansburg.

New Orleans Public Service, Inc., New Orleans, Louisiana, has recently completed several distribution construction projects including: Main replacement project in the French Quarter involving replacement of 1077 ft of cast iron main on Royal Street with 1100 ft of steel utilization pressure main; 33 services had to be connected to the steel main. Main extension project to serve Bestwell Gypsum Co. involved 2200 ft of 10-in. steel high pressure main and 60 ft of 6-in. steel high pressure service. A major main extension consisting of 4500 ft of 12-in. steel high pressure main has been installed in the eastern section of the city, and will serve the J. A. Folger and Co. coffee processing plant now under construction. New main runs northeast from the end of the existing gas service supplying the Michoud Ordnance Plant; meter regulator installation for the new coffee processing plant will be placed at the end of 210 ft of 4-in. steel high pressure gas service.

Laclede Gas Company, St. Louis, Missouri, has completed construction on a 5.3-mile 20-in. extension of its belt line system along north Lindbergh. Extension of mains into the area north of Olive Street Road will make it possible to inject and withdraw gas from underground storage more easily. Work is being done by company crews.

Minneapolis Gas Company, Minneapolis, Minnesota, has completed an unusual main replacement project — smaller pipe was first pushed, then pulled through old larger-diameter cast iron main. Project included two blocks from 53rd to 55th Avenues in Camden. Gas was shut off one day for each block. The old 6-in. main was isolated from the system, and a new 2-in. steel main was pulled through the old main.

Wisconsin Michigan Power Co., Appleton, Wisc., has PSC "okay" to build a $287,000 city gate station and supply main in Appleton and Grand Chute.

Wisconsin Power and Light Co., Madison, Wisc., plans to spend $3,125,000 to install mains to bring natural gas to Portage, Baraboo, Randolph, Fox Lake, Pardeeville, Wyocena, and Cambria and to connect with a pipeline extension Michigan Wisconsin Pipe Line Co. proposes to construct.

Wisconsin Natural Gas Co., Racine, Wisc., plans to build a $270,000 gas operations headquarters in Racine. New building will consolidate distribution operations currently conducted in three separate buildings.

Milwaukee Gas Light Co., Milwaukee, Wisc., has received authority from PSC to spend $6,188,898 for a 75-mile 8-in. line between Baraboo and Sparta. Approximately $3,892,898 of this total is tabbed for distribution systems in 16 communities the line will serve.

Northern Indiana Public Service Company, Hammond, Indiana, plans to have new distribution systems complete in 35 communities in time for the heating season. Space heating restrictions, clamped on in 1947, were lifted following FPC action in the Midwestern Gas Transmission Company construction project last year, and subsequently some 17,000 permits have been issued to NIPSCO's waiting list. Since then, 35,000 additional space heating permits have been authorized—for a total of 52,000 permits issued to date. Of this number 38,000 space heating installations have been made by heating contractors to date. Gas is now flowing in North Judson, Mentone, Etna Green, Bristol, and Ogden Dunes, and will be turned on in several newly-franchised communities during the next month. Construction is underway in the following newly-franchised communities: North Liberty, Walkerton, Royal Center, Bourbon, Francesville, Monon, Culver, Reynolds, Monticello, Louts, Wolcott, Remington, Goodland, Fowler, Kentland, Pierceton, Atwood, Wakarusa, Syracuse, Milford, Ligonier, Knox, Medaryville, LaGrange, Hebron, St. John, Lowell, LaCrosse, Pines, and Portage.

In the Ft. Wayne area, a separate system, independent of northwest system, NIPSCO has obtained approval for release of additional 4500 space heating permits for that area by investing $335,000 in improved piping and propane facilities at the Hale Avenue Gas Plant in Ft. Wayne — center of the system; and by securing an additional 10.5 million cu ft daily supply from Panhandle Eastern Pipe Line Co. Work has just recently been completed on addition of 6 more propane storage tanks bring the total to 26 with a storage capacity of 650,000 gal of propane.

NIPSCO is currently probing the area near Royal Centre (12 miles northwest of Logansport in the Wabash Valley) for possible "aquifer" storage. Core samples and instrument tests seem to show a suitable sandstone structure existing at about 1350 ft.

Fitchburg Gas and Electric Light Company, Fitchburg, Massachusetts, has completed a new propane gas manufacturing plant on Pleasant Street. Lunenburg, and test runs have been made. Plant will be on a standby basis for use during winter in high demand periods.

DIG TRENCH AND BELLHOLES IN SINGLE PASS

The Cleveland JS-30 Trencher digs bellholes at pipe joints, digs flush to obstructions, slopes as it digs.

Note the ample-width bellhole in the foreground above. The JS-30's exclusive power-shifted digging wheel shifts 2½ feet to each side of center to dig bellholes like this and to keep trench in line even when crawlers are being steered around side obstructions.

The JS-30's wheel power-*tilts*, too—saves blocking and cribbing when either crawler track is higher than the other on curbs, side slopes, etc.

Note, too, how the JS-30's power-shifted V conveyor with operator-controlled speeds up to 1,000′ per minute—another Cleveland exclusive—easily handled the big spoil volume from the wide-sloped trench. The JS-30 sloped the trench to 6′ top width as it dug.

The JS-30 is a trencher of amazing utility —get all the facts now, from your Cleveland distributor.

CLEVELAND TRENCHER

THE CLEVELAND TRENCHER CO., 20100 ST. CLAIR AVE., CLEVELAND 17, OHIO

Merry Christmas ✳ Happy New Year

standard pipeprotection inc.

3000 SOUTH BRENTWOOD BLVD. • ST. LOUIS 17, MO.

Distribution Developments

New Bedford Gas and Edison Light Company, New Bedford, Massachusetts, (subsidiary of NEGEA) has construction underway on a $250,000 gas main extension to supply gas to the New Bedford Industrial Park. Currently work is underway on a 206,000 ft line under Church Street in the north end of New Bedford; an additional 15,000 ft of 12-in., 5600 ft of 8-in. steel main, and a regulator station will be required to complete the project.

Pueblo Gas and Fuel Company, Denver, Colorado, has construction well underway of a new 10-in. intermediate pressure line on Michigan Avenue from Main Street Bridge to Adams Street in Pueblo. In another project, crews have moved into the Belleplain area just east of the city limits and progress is moving rapidly to finish the first phase of the new distribution systems to serve the area.

Construction has been completed on 5600 ft 4-in. feeder main and 3300 ft of a 2-in. distribution system to serve the LaVista Hills area west of Pueblo, a new subdivision.

Public Service Electric and Gas Company, Newark, New Jersey, plans to build a new Bergen Division gas distribution headquarters on a 13-acre plot in Oradell, located south of New Milford Avenue. The new building is adjacent to the New York and New Jersey Railroad and readily accessible to State Highway 502 and Kinderkamack Road. A one-story Z-shaped, modernistic structure, the new gas distribution building will include general offices, servicemen's room, storeroom loading dock, repair, and service garage and welding shop.

Saskatchewan Power Company, Regina, Saskatchewan, Canada, has completed gas services in 21 of 24 centers included in its 1960 construction program. They are: Elrose, Kyle, Burstall, Smiley, Fort Qu'Appelle, Tompkins, Balcarres, Qu'Appelle, Pense, Riceton, Kamsack, Canora, Carrot River, Nipawin, Indian Head, Lang, Midale, Assiniboia, Grenfell, Wolseley and Broadview. Construction is proceeding at Soughton, Claybank and Ormiston.

Southern Union Gas Company, Dallas, Texas, has recently completed a 7-mile 2-in. supply line from Ganado to a new Indian boarding school recently completed by the Bureau of Indian Affairs at Kinlichee. Bill Baum of Gallup was contractor for the project. The Kinlichee school will use gas for heating, water heating, kitchen appliances, and two 125-kilowatt generators driven by natural gas engines.

New from J. I. Case

DIESEL . . . cost-pinching, sub-zero starting DIGGERS . . . powerful to fit your needs

Now — in addition to a full line of *new* gas-powered *Utility* tractors and equipment — Case is proud to announce the availability of famous Case-built *Dynaclonic* diesel engines, as power options in all 1961 wheel and crawler models. Compact, powerful, and thoroughly job-tested, these heavy-duty diesel engines let you realize the low investment and high trench-production of Case *Utility* backhoe-loaders — *plus* the extra fuel-savings and long-life stamina of diesel power.

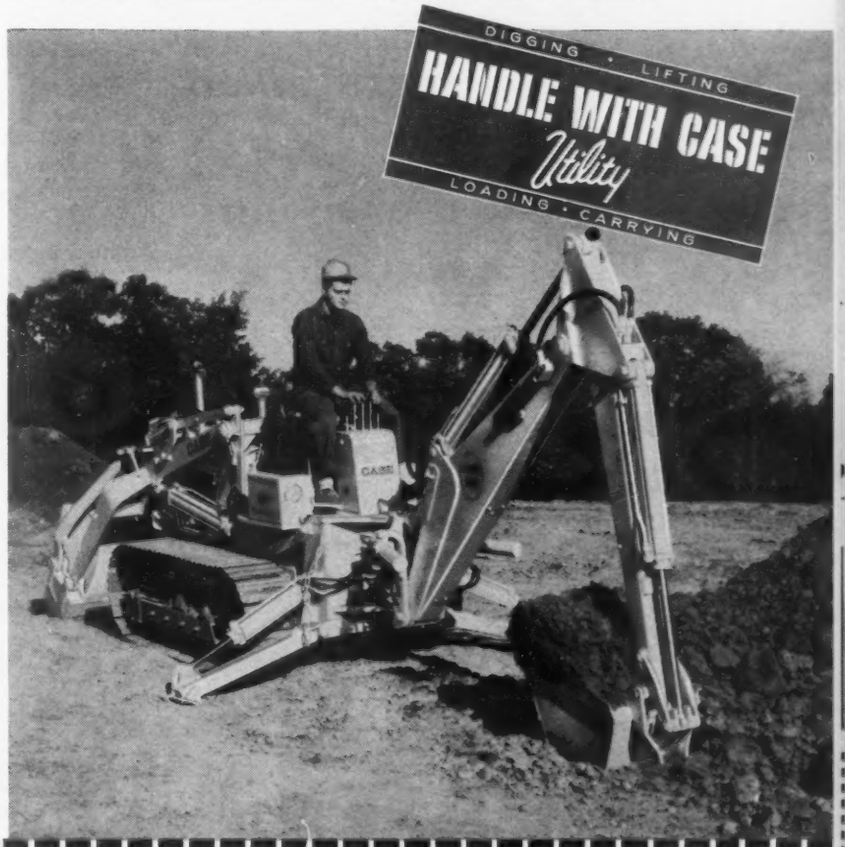
Husky 4-cylinder Case diesel engines have earned a world-wide reputation for quick, easy starting — *even in sub-zero weather.* They give you smooth, high-torque power for fast load-starting and heavy pulls. Exclusive *Dynaclonic* combustion system mixes fuel and air thoroughly . . . burns clean to give you maximum work-output from every drop of low-cost fuel. Five main bearings and other heavy-duty features keep wear-rate low . . . repair costs to a minimum.

Best of all, these new Case *Utility* machines give you the assurance of better overall performance for your dollars because each complete outfit — tractor, engine and mounted equipment — is engineered and built by Case, for better quality control and dependable one-stop servicing.

Get a Case diesel demonstration — FREE!

Stop in at your Case Dealer's real soon and ask him to put one of these new high-production *Utility* diesel diggers through its paces for you. Or send the coupon for more details on machines that interest you.

2 New work-and-run rigs — Husky Model 530 (shown) is powered by *Dynaclonic* diesel or 47 hp gasoline engine. Backhoe reaches out 20', digs 14' deep . . . 2000-lb loader dumps high, loads out fast. Economy Model 430 has 35 hp *Dynaclonic* diesel or 37.5 hp gas power-plant . . . 10' backhoe, 1000-lb or 1200-lb loader. Both models offer quick-change attachments for pipe-setting and materials handling.



Powerful new Model 310E Crawler

Choice of 35 hp *Dynaclonic* diesel or 42 hp gasoline engine. Travels rough terrain . . . digs 14' deep with backhoe . . . loads-out 3500-lb payloads in ¾-yd front-loader. Foot-operated swing on *all* Case diggers speeds dig-and-dump, boosts trench-footage per day.

J. I. Case Co., Dept. M1730, Racine, Wis.

Send details on Case *Utility* machines: ☐ Diesel powered ☐ Gas

☐ Wheel-mounted 14' backhoe, 2000-lb loader unit ☐ Wheel-mounted 10' backhoe 1200-lb loader ☐ Crawler-mounted 14' backhoe ¾-yd loader unit

CASE. *Utility*

Name_____ Address_____

Position_____ City_____

Company_____ State_____

CU-CL-265

Distribution Developments

Gas for Kentucky towns of Corbin and London — More than 116,000 ft of 6-in. plastic-coated steel pipe have been installed to carry natural gas through highly corrosive coal field soil and swampland in Kentucky. Contractor was Cumberland Contracting Co. of Monticello, Ky., who laid the line for Petroleum Exploration of Lexington, Ky.

Brockton Taunton Gas Company, Brockton, Massachusetts, is extending its mains from East Taunton to Raynham to supply commercial establishments along Route 44. The extension, which parallels the site of a proposed Jordan Marsh store, will also make additional gas supplies available to Chandler Mfg. Co.

Lehigh Valley Gas Division of the United Gas Improvement Company has changed from 520 Btu, 0.65 specific gravity manufactured gas to 1030 Btu, 0.60 specific gravity natural gas. The change affected Hazleton, West Hazleton, and Hazle Township.

Inland Natural Gas Company, Ltd., Vancouver, B. C., Canada, plans to extend its gas mains in the East Kootenay region of British Columbia to serve the communities of Fernie, Cranbrook, Kimberley, Marysville, and Creston.

Clarke-Mobile Counties Gas District, a new association of municipalities of Jackson, Grove Hill, and Thomasville, in Clarke County, Alabama, plans to build a $3,000,000 distribution system to receive gas from United Gas Pipe Line Co.'s to-be-built lateral line in north Mobile County. FPC recently authorized United to build a 0.03 mile, 6-in. line to a sales meter station and appurtenant facilities, at a cost of about $22,024, to provide service to the district.

Houston Natural Gas Company, Houston, Texas, has installed new radio facilities in its Corpus Christi office which will enable both HNG and Houston Pipeline Company to improve control of gas in their interrelated systems, because dispatchers will have constant communication concerning pressures in lines in the South Texas area. New facilities include a 75-ft self-sustaining radio tower. Signals can be relayed from the Corpus Christi tower to the HPL tower at Blanconia, where they can be relayed to Edna. Signals originating from the new tower can also reach all radio-equipped cars in the Blanconia radio area.

Arizona Public Service Company, Phoenix, Arizona, has construction underway on a 6-mile 12-in. high pressure feeder line to provide alternate service to customers in north Phoenix, north Glendale, Deer Valley and east portion of Paradise Valley. Line runs along south side of Northern Avenue between 27 and 25 Avenues and taps El Paso Natural Gas Co., transmission line at the company's Glendale city gate. Project included boring of a casing to hold main under the Santa Fe tracks and Highway 60-70-89 at Northern Avenue. Contractor is Desert Pipe and Construction Co. of Phoenix.

Minco Gas Authority, Minco, Oklahoma, newly-formed utility has recently installed a $250,000 gas distribution system to serve the communities' 1000 residents.

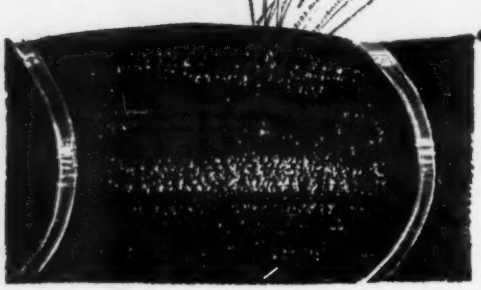
specification for preventing rock damage:

"Coating shall be protected from damage by the application of Midwestern's KAPCO ROCK SHIELD"

The successful coating of pipelines for installation in rock areas depends to a large extent on the outer shield used . . . and Midwestern's KAPCO Rock Shield has proved to be one of the most effective on the market in living up to performance specifications and providing positive protection against costly rock damage. KAPCO is a tough, mastic composition board that provides maximum protection to pipe and coating and is available in a variety of thicknesses to meet your particular needs. Application is fast . . . simple . . . the boards are simply strapped into place with pressure sensitive filament tape or steel strapping. A complete pipe section can be covered in only a few minutes.

Stop costly rock damage that can lay your pipeline open to attacks by corrosion. Contact one of the nine conveniently located Midwestern offices for a complete explanation of the many advantages of KAPCO Rock Shield.

KAPCO



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(Exploded View)

A Coal Tar TAPECOATing that Provides Single-Wrap Protection **PLUS** an Outer Wrap

- ★ It's more than just a coal tar coating!
- ★ It's designed for single-thickness application!
- ★ It has advanced features of uniformity!
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- ★ It includes a tough outer wrapper!
- ★ It combines 20 years of manufacturing and field application experience!
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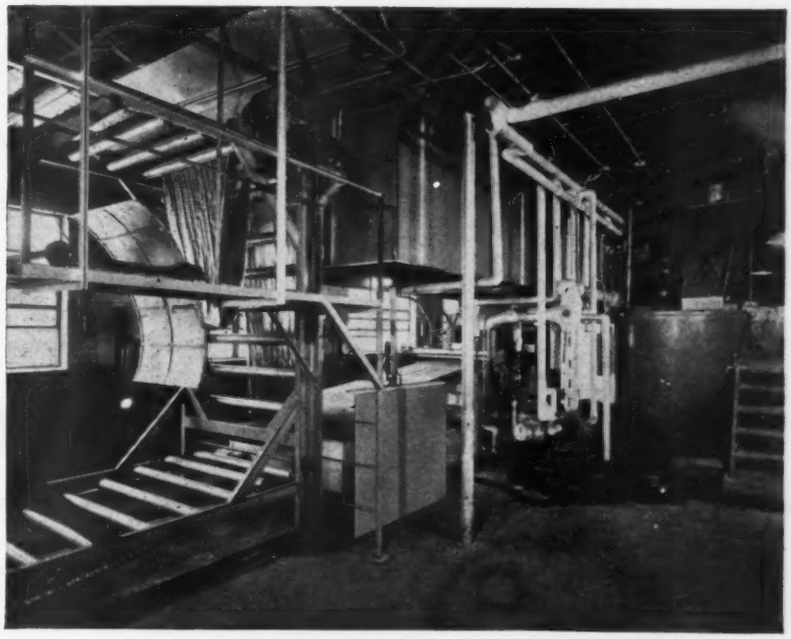
Write for the complete details today.



View of specially-designed machine developed after five years of research by Tapecoat engineers to convert raw materials automatically into TAPECOAT 20.

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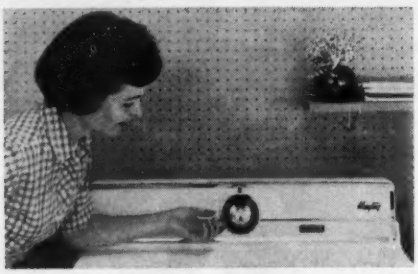
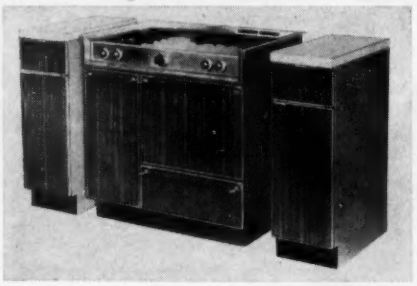


Electronic control eliminates guesswork in Maytag's new gas dryer; makes over-drying impossible. Moisture-sensing elements on the three baffles attached to the interior of the dryer's revolving drum, act as electronic "fingers" constantly "feeling" clothes while the dryer is operating. When the moisture content falls to a predetermined level, these sensing elements automatically cause the dryer to be shut off, eliminating any chance of over-drying. Three automatic settings are available on Maytag's "Magic Touch" dryer—*damp dry* leaves clothes with proper moisture for immediate ironing; *regular fabrics* provides proper dryness for wearing or storage and *"wash 'n wear"* not only properly dries but de-wrinkles wash-and-wear articles. Two additional settings are "air fluff," for tumbling without heat or for sprinkling, and a *50-minute time dry cycle.*

CIRCLE (1) ON THE REPLY CARD

Built-Instant Look . . . Sunray Stove Company's new line of free-standing gas ranges have a "built-in" look. Designed to be inserted in same space ordinarily occupied by a 24, 30, or 36-in. base cabinet the new ranges allow builders to install



custom-looking kitchens without the custom installation costs. Ranges have a flange at the top that extends over adjoining cabinets and provides a seal against counter top. Builders can handle ranges at or below cost of comparable built-in equipment and, since installation cost is virtually eliminated, substantial savings in complete kitchen cost are realized.

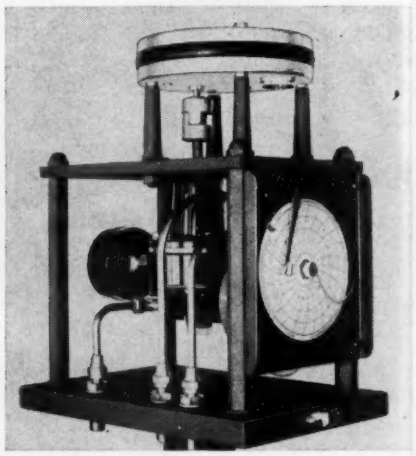
CIRCLE (2) ON THE REPLY CARD

Motorola's new extensively-transistorized 2-way radio equipment . . . its advantages such as low current drain, compactness, reduced maintenance, and high audio power . . . are described in new booklet. Special section covers research and engineering of new line.

CIRCLE (3) ON THE REPLY CARD

Regulators . . . Reliance-type CBV series 100 and 200 pressure regulators and series 300 low-pressure regulators . . . used for reduction, relief, and back pressure applications in distribution, and industrial installations . . . are subject of two new free bulletins from American Meter Co.

CIRCLE (4) ON THE REPLY CARD



Continuous gas sampler . . . for accurate analysis of chemical and physical properties of gas . . . has been developed by ARCCO Instrument Co. Gas sample is gathered in a portable container for delivery to laboratory. Supplied with a mechanical drive, unit also includes a pressured recorder in a single case. Available for sample ranges up to 150 psig. Can be employed in any hazardous area where vapor proof equipment is required as unit needs no external source of power.

CIRCLE (5) ON THE REPLY CARD

Extra Heavy All-Malleable COUPLING

Engineered for latest distribution pressures and for installation ease. Inspect its construction and quality materials in detail.

Provides More Deflection Than Ever

Top Quality for 22 Years in Gas Distribution Equipment

Get helpful CATALOG 29. Photos, specs, detail drawings & much helpful data for modernizing or new installations.

PERMANENCY Rely on NORTON-McMURRAY for the finest! NORMAC continues to modernize and improve couplings and fittings in step with latest gas distribution demands. 22 years experience concentrated on ONE purpose . . . the BEST! Today, major gas distribution companies say "NORMAC" to define their standard of quality.

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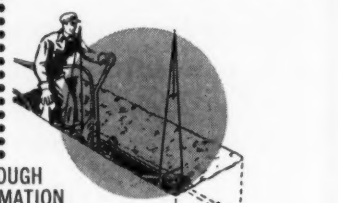

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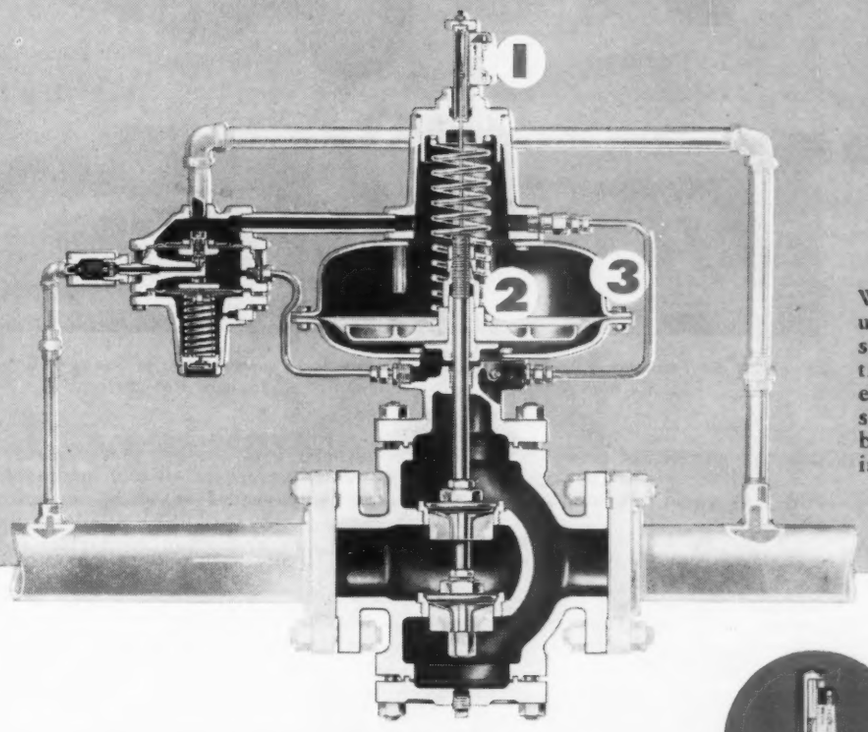


FISHER TYPE 298T

APPLICATIONS

While the Type 298T is most widely used as an intermediate or low pressure district regulator on gas distribution systems, it is equally effective in industrial applications such as heat treating furnaces, bakeries, boiler plants, and other installations.

SIZES AND PRESSURE RANGES

VALVES BODIES

- Double port "A" Body with metal to metal seats. Sizes—1" to 12"
- Double port "K" Body with "O" ring soft seat Sizes—2" to 12"

LOADING PILOTS

- Type 61H low pressure pilot Downstream pressure ranges—5" w.c. to 2 psi—2 to 10 psi—10 to 20 psi
- TYPE 61H High pressure pilot Downstream pressure ranges—10 to 65 psi
- TYPE 61HH Extra high pressure pilot Downstream pressure range—35 to 100 psi

MAXIMUM INLET PRESSURE

Valve Sizes 1 through 4"—up to 250 psi—6"—up to 200 psi—8"—up to 100 psi

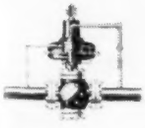
FEATURES

1 Travel indicator shows valve position. No stuffing box—no friction causing seal! Enclosed in glass. Supplied as standard with no extra charge.

2 Specially constructed tapered locknut on rugged stem connection—no inner valve spinning under high gas flows.

3 Steel diaphragm casings of modern design for additional safety and adequate stroke for valves of all sizes.

If you want additional information about the FISHER Type 298T, write for Bulletin P-298C.



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SINCE 1880

PRODUCT PARADE

Comparison of cost allocation techniques adopted by the Federal Power Commission in its Phillips decision—with the techniques suggested by the various parties to the proceeding—is now available from Boni, Watkins, Jason & Co. Report is entitled, "A Comparative Summary of Views on Cost of Service in the Phillips Case." Also available—free—is a summary comparison of the gas prices set by the FPC in its Statement of General Policy with prices actually being paid in 1959.

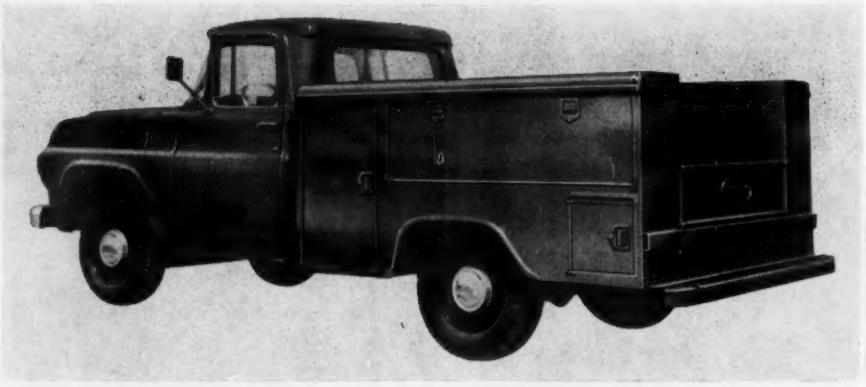
CIRCLE (6) ON THE REPLY CARD

Air receivers for truck-mounted compressors are described and pictured in new 2-color catalog from Kargard Co. Included are both code and non-code air receiver tanks, in vertical, horizontal and portable sizes from 3- to 120-gal capacity.

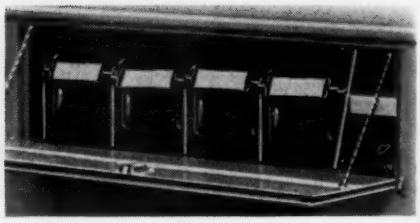
CIRCLE (7) ON THE REPLY CARD

Oil meter that records automatically the amount of lubricating oil used by compressors of all types, is now available from Service Recorder Co. Newly-developed "Servis" oil meter provides continuous check of make-up oil used by compressors; allows operators to determine if specific compressor is getting enough oil or using excessive amounts and if it should be inspected to prevent high operation and maintenance costs. Most operators use 3 oil meters on each compressor—one to meter make-up oil to crankcase, another to measure oil to power cylinder lubricators; and a third to meter oil into compressor cylinder lubricators. New meters function on both gravity-fed or pressure-fed lubricating systems.

CIRCLE (8) ON THE REPLY CARD



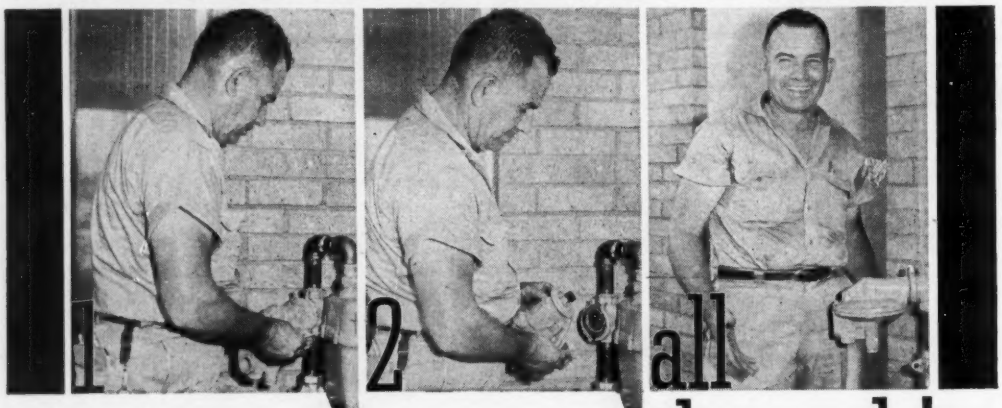
Streetside compartment of Series 44-G body for tin meters.



Streetside compartment of Series 44-G body for cast iron meters.

Recommendations of crewmen, foremen, and other supervisory personnel on features they would like to have in a service and maintenance truck body for gas service work, have led to the development of Powers-American's new Series 44-G body. Company officials call new series one of the most efficient bodies ever produced because of its adaptability to a wide variety of service operations. Carefully planned compartment space allows for orderly storage of all tools and supplies normally needed in utility service and maintenance work. Bodies are available in 75, 90, and 104-in. lengths for installation on vehicles having cab-to-axle dimensions ranging from 40 to 60-inches; carry either tin or cast meters.

CIRCLE (9) ON THE REPLY CARD



4 models: Standard no-seal; automatic cutoff; full capacity internal relief; internal relief and automatic cutoff combined.

Easy On! Easy Off! through!

REYNOLDS HOUSE SERVICE

8010 SERIES GAS REGULATOR

Inspection's a breeze with this versatile, popular Reynolds house service regulator. Exclusive V-band stainless steel coupling with a single screw allows simple 1-2-3 inspection as shown above: 1. Diaphragm case comes off easily. Valve body stays in line. 2. Valve disc and seat inspected. 3. All through! After screw quickly inserted in V-band clamp.

Now's the time to stock up on this fine house service gas regulator. For a look at our entire line, write for a free catalog.

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GAS CONTROL Since 1892

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REYNOLDS GAS REGULATOR CO., INC., ANDERSON, INDIANA

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Industrial band clamp and coupling catalog is now available from Marman Division of Aeroquip Corp. Complete design information is given for engineers in the 44-page catalog. Products featured include identification tag clamps, light-duty and heavy-duty repair clamps for use in correcting pipe leaks and splits; V-band couplings and flanges for general industrial uses; and pipe joints for use in joining pipe without cutting or threading.

CIRCLE (10) ON THE REPLY CARD

Pipetron's new holiday detector inspects coating on buried pipelines, locates pipe, and locates shorts between buried pipe. Can be used to inspect coating shortly after burial to reveal damage caused by backfill or for regular maintenance inspection to avoid leaks, reduce upkeep costs, and cathodic protection costs. Portable instrument consists of receiver, transmitter, search coil, and several accessories. Transistorized transmitter permits easy inspection of several miles of pipe per day. Output meter in transmitter assures optimum matching to pipeline for maximum signal strength. Visual indicator in receiver, in addition to earphones, eliminates costly digging by permitting accurate pin-pointing of flaws in pipe coating.

CIRCLE (11) ON THE REPLY CARD

Computers in Small Business Accounting . . . Report on how an Illinois firm is using a Bendix G-15 general purpose digital computer to open the door to electronic data processing for small business is described in a report now available from Bendix Computer Division.

CIRCLE (12) ON THE REPLY CARD

Hinged closure bulletin updated by Tube Turns. New design features and extended size ranges described in revised bulletin. Dimensional data covers closures produced in carbon steel in sizes 2 through 42-in. for ASA 150, 300, and 600-lb service.

CIRCLE (13) ON THE REPLY CARD

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LEAKAGE CONTROL SURVEYS
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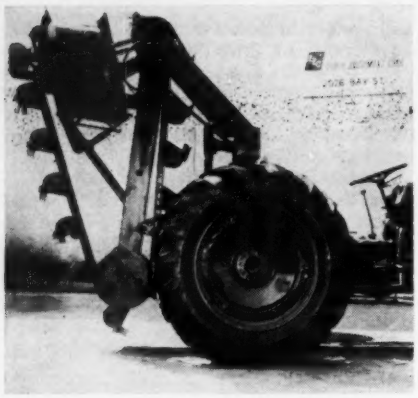


Everett Trencher . . new series S-1500 . . . tractor mounted, ladder-type unit with high carbon steel buckets attached to double chain line utilizes tractor's hydraulic system to lift and lower digging boom. Digs down to 42-in.; at 12-in. standard widths or up to 18-in. in 2-in. increments using extensions added to buckets, at a speed of up to 600 ft per hour. Important features of new series include redesigned heavier and more stable digging mast; improved visibility—operator can now see bucket line while digging; and rock guards to afford maximum protection to tail wheel and bucket line.

CIRCLE (14) ON THE REPLY CARD

Literature available on Waste King Universal's new line of Dreyfuss-designed free-standing gas ranges. All 28 models are illustrated; specifications, features, and benefits of range line are listed.

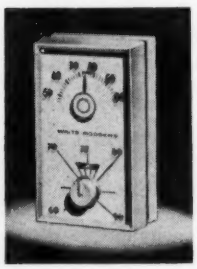
CIRCLE (15) ON THE REPLY CARD

PRODUCT

Sears' has just added a new 13 cu ft 2-door gas refrigerator to its line of Coldspot refrigerators. New unit offers convenience that puts it on a par with even most advanced electric units . . . features include completely frostless freezing, aluminum slide-out shelves for flexibility, convenience and cleanability, and an automatic ice-cube maker that keeps a large supply of ice cubes always on hand. New Coldspot refrigerator, approved by A.G.A. and made by RCA-Whirlpool Corporation, is being introduced in 6 selected cities — Baltimore, Chicago, Cleveland, Houston, Los Angeles, and Pittsburgh. National distribution through Sears retail stores is scheduled for January 1961.

CIRCLE (16) ON THE REPLY CARD

Thermostat . . . styled in the "straight-line look". . . fills need for economical model with contemporary design and modern performance features. A medium-priced companion to the horizontal D'Luxline thermostat introduced in November . . . the Mainline model has a durable plastic base and snap-on cover of terra-beige color, a clear plastic-covered thermostat, and soft white dial face with polished gold markings and numerals. Thermostat may be mounted directly to the wall or on an electrical outlet box.



CIRCLE (17) ON THE REPLY CARD

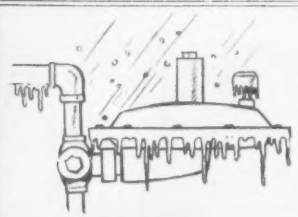
Copper tube handbook . . . for plumbing, heating, air conditioning and refrigeration personnel . . . is available from Scovill Manufacturing Co. The 32-page handbook includes technical and installation data with guides to selection of correct sizes and types of tube and pipe, as well as soldering, brazing, and flared joint information.

CIRCLE (18) ON THE REPLY CARD

Williams bronze valve catalog . . . available from Detroit Controls Division . . . contains competitive cross reference charts and weight tables for comparative purposes and data covering a variety of pressure controls, temperature controls, solenoid valves, and strainers. Information condensed into 20-chock-full-pages.

CIRCLE (19) ON THE REPLY CARD

UNIVERSAL



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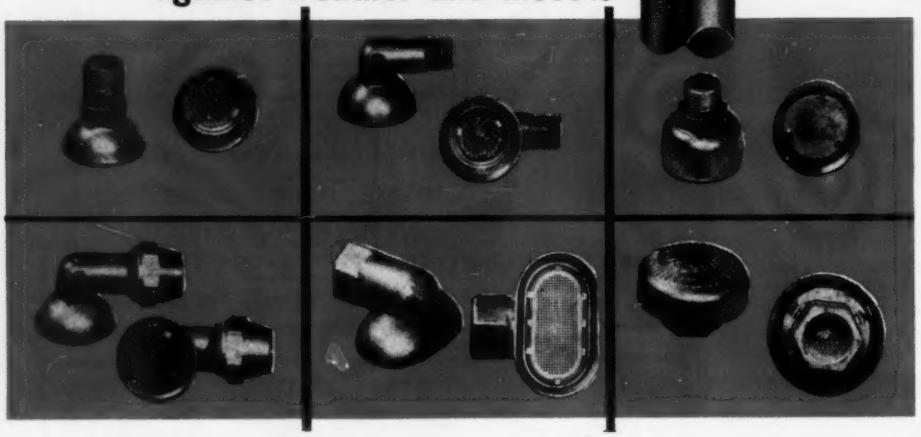

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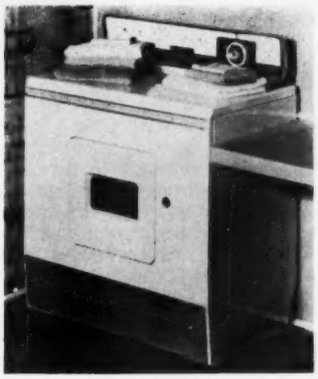
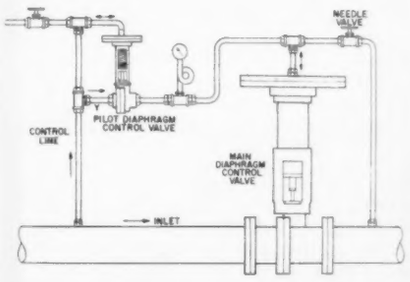


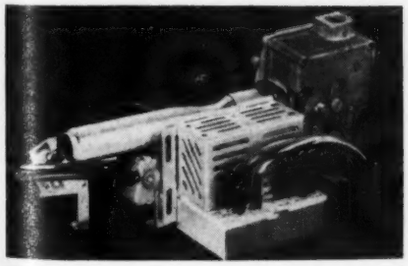
Maytag's combination washer-dryer has been adapted for gas fuels to meet the growing demand for gas appliances. Ideal for limited-space laundry, unit is cabinet height and depth and only 34 inches wide. Continuous operation provides start-to-finish handling, washing, and drying without transferring articles from one unit to another. Timed bleach injection, automatic rinse-additive dispenser, and other "top-of-the-line" features are included in the new model. Main burner rated at 25,000 Btu per hour input is lighted automatically by pilot when timer dial is advanced automatically or manually into drying cycle. Burner is adaptable to all types of approved gas fuels.

CIRCLE (20) ON THE REPLY CARD



Back pressure regulators are now available from OPW-Jordan in 4 and 6-in. sizes. Sliding gate and plates used in both the pilot and main valve give accurate regulation, tight shutoff, and minimum maintenance. Self-lapping and self-cleaning seats cut costs and provide better control over plant operations. System is suitable for pressures to 250 psi. Main valve is available in cast iron with 125 lb ASA flanges, or ductile iron with 150 or 300 lb ASA flanges. Pilot is standard screwed end control valve with special seats.

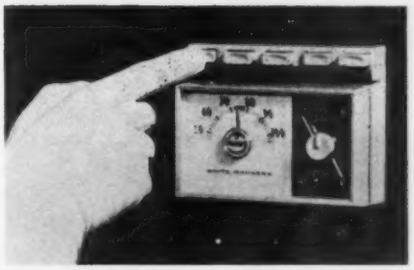
CIRCLE (21) ON THE REPLY CARD



Automatic direct spark ignition system for gas applications such as clothes dryers, unit heaters, infra-red heaters and other applications where draft and pilot flame failures present a problem, has been introduced by Controls Co. of America. System provides direct ignition of main burner gas by means of intense electric spark that eliminates need of a pilot burner and flame. Unit can be mounted in any position and is provided with an electro-magnetic type control valve that assures 100% tight shutoff of gas flow. Thermally actuated electric flame detector shuts off main burner gas in event of ignition failure and also controls and terminates spark after proving presence of main burner flame. Safety lockout control is used to close the main burner valve in event gas does not ignite or there is no gas in the burner.

CIRCLE (22) ON THE REPLY CARD

Thermostat for selective push-button control of heating, cooling and ventilating operation is described in new literature from White-Rodgers Co. Called PushButton, the 'stat is third model in new contemporary-styled series. Unit combines the



D'Luxline thermostat with unique sub-base that uses pushbuttons for switching action. Eight different switching combinations are available. Sub-base features built-in level-bubble to save on installation time and assure level mounting for exact calibration.

CIRCLE (23) ON THE REPLY CARD

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Recent A.G.A. Reports . . .
The following reports are available from the American Gas Association headquarters, 420 Lexington Avenue, New York 17, New York.

New Way to Peak Shave—Recent study shows feasibility of producing natural gas supplement from light liquid hydrocarbons by using the integral pressure hydrogasification process. New process continuously converts entire range of feedstocks to natural gas substitutes and, over a wide range of load factors, is competitive with presently-used manufacturing methods of supplementing natural gas during periods of peak demand. In a PAR-sponsored study aimed at developing a low investment cost process capable of delivering a high heating value fuel gas directly substitutable for natural gas, three thermal cracking methods of operation were investigated—(1) in the absence of a carrier gas; (2) in the presence of hydrogen carrier gas supplied from an external source (pressure hydrogasification), and (3) with hydrogen carrier gas generated as part of the process (integral pressure hydrogasification). Detailed information on raw material requirements, product yields and compositions, and equipment design is given for each method of operation.

"Continuous Production of Natural Gas Supplements from Natural Gasoline and Petroleum Distillates in a Tube Furnace," *by W. G. Bair, and H. R. Linden, A.G.A. Research Bulletin No. 27, Price, $5.*

Want to reduce service calls resulting from blocked burner ports? New research bulletin should help. It discusses factors causing dust and lint collection on underside of burner ports and suggests ways to reduce this condition.

"Minimizing Lint Stoppage of Atmospheric Gas Burner Ports," *A.G.A. Laboratories Research Bulletin 79. Price, $2.50.*

Basic Burner Research. Theoretical burner design concepts have been correlated to actual appliance burners in new report. Results? It has been proved fundamental flashback, blowoff, and yellow tipping characteristics of fuel gas-air mixtures do apply to the operation of gas appliance burners in free air and in appliances. Now practical application can be made of fundamental data previously obtained.

"Relations of Fundamental Flashback, Blowoff and Yellow-Tip Limits of Fuel Gas-Air Mixtures to Design Factors of Burners in Gas Appliances," *A.G.A. Catalog Number 128/ DR. Price, $2.*

American Standard Graphical Symbols for Welding, Y32.3-1959. *Published by American Institute of Electrical Engineers and American Society of Mechanical Engineers, 29 West 39th Street, New York 18, New York.*

Danger of welds that are too weak and the unnecessary cost of welds that are too strong can both be eliminated if the engineer will use welding symbols set forth in newly-revised American Standard. See for yourself how to give explicit instructions to the welding shop using the symbols developed by a committee of the American Welding Society acting as a Task Group for Y32.

Epoxy Resin: Market Surveys & Users Reference, *prepared by graduate students at the Harvard Business School. Published by Materials Research, P. O. Box 363, Cambridge 39, Massachusetts. Price, $18.50.*

Report is the result of extensive research and a survey of 1000 companies manufacturing, selling, and/or using epoxies. Points out ways to save money by using epoxies, brings reader up-to-date on current uses, and provides a factual measurement of performance and cost comparisons of the epoxies. Eighteen chapters detail uses and cost experiences of companies in various industries including public utility. Users' reference portion of the study also lists periodical literature as well as author's selective listing of recommended reading by use area. A formulator directory is listed by use area and by location.

Welding Handbook, Section III, Miscellaneous Metal Joining & Cutting Processes, *4th ed., edited by Arthur L. Phillips. Published by the American Welding Society, 33 West 39th Street, New York 18, New York. Pages, 512. Price, $9.*

Welding Handbook's latest section includes four new welding processes and joining methods that will be of interest to gas distribution engineers — thermit welding, ultrasonic welding, adhesive bonding of metals, and welding of plastics. Chapter on thermit welding covers its fundamentals, components, mixtures, cooling, finishing, and common applications. Chapter on ultrasonic welding, one of the newest welding processes to have commercial applications. Cites minimum pressure and no heat source as main advantages. Details are given on fundamentals of ultrasonic welding, its techniques, weld characteristics, quality control, equipment and applications. New process of adhesive bonding of metals is also described. Chapter on welding of plastics includes fundamentals, definition of materials, equipment and applications of the technique to welding of plastic pipe and fittings.

1960 Manufacturers' Agents' Guide. *Published by the Manufacturers' Agent Publishing Company, 505 Fifth Avenue, New York 17, New York. Pages, 166. Price, $15.*

First revision in two years, new guide is classified by industry and provides comprehensive listing of manufacturers and their addresses. Includes information on their principal products, estimated credit rating, and name and title of the sales executive. Lists more than 11,500 manufacturers who distribute products through manufacturers' agents. Details steps to follow in communicating with manufacturers.

Technical Communication by *George Harwell. Published by The Macmillan Company, 60 Fifth Avenue, New York 11, New York. Pages, 318. Price, $5.*

How to put technical information across clearly and efficiently—whether it be in a report, letter, article, or speech—is the aim of this book. Basically, the elements of good writing are the same for each type of presentation. Although written primarily for the engineering student, the book's simple and direct explanation of how to write well will be useful to almost any reader. Of particular interest is the chapter on how to present tables, graphs, and figures so they can be easily understood. A book like this is a good reference even though you don't sit down and read it through.

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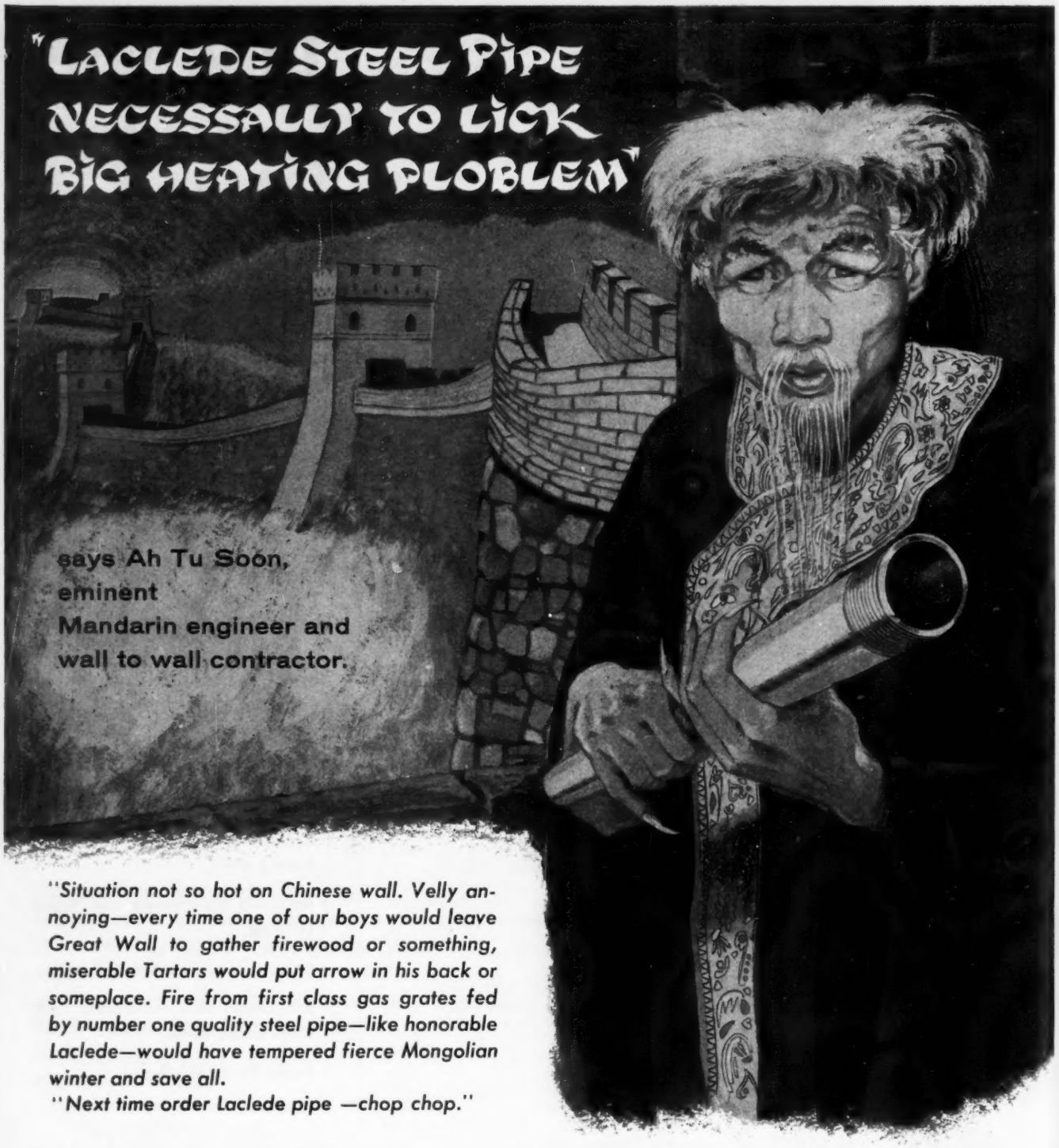
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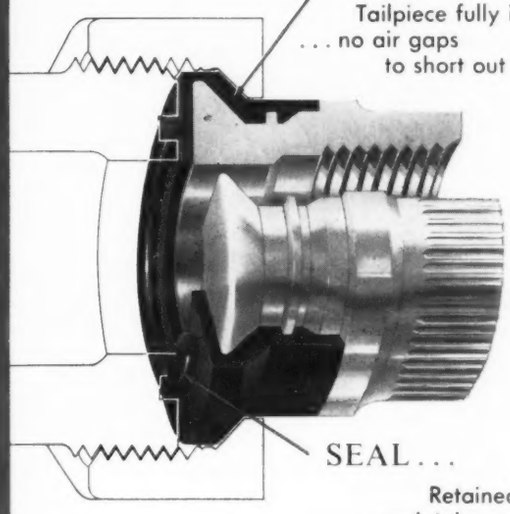

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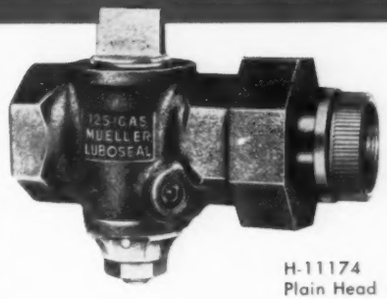
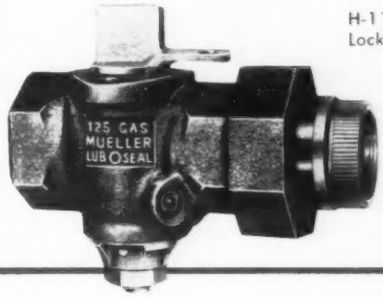


H-11174
Plain Head

H-11179
Lock Wing



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Iron body, bronze key
Straight way, solid head
Tamperproof

Inlet: Inside I.P. Thread
Outlet: Insulating Union
Finish: Black
(Tailpiece cadmium-plated)

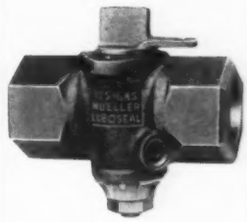
Working pressure: 125 p.s.i.
Working temperature range: —20° F. to 150° F.
Sizes: ¾", 1", 1¼"

A full line of 125 pound gas meter stops

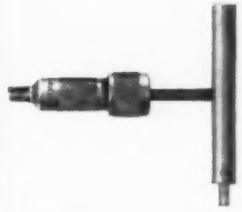
H-11170
Plain Head
Sizes: ¾", 1", 1¼", 1½", 2", 2½"

H-11175
Lock Wing
Sizes: ¾", 1", 1¼", 1½", 2", 2½"

H-11173
Plain Head
Recessed Ends
Sizes: ¾", 1", 1¼", 1½", 2"



H-11178
Lock Wing
Recessed Ends
Sizes: ¾", 1", 1¼", 1½", 2"



H-11199
Relubricating Tool
Handy tool for regreasing all LubOseal Stops to maintain original turning ease. Convenient H-853 grease sticks just fit tool—no waste.

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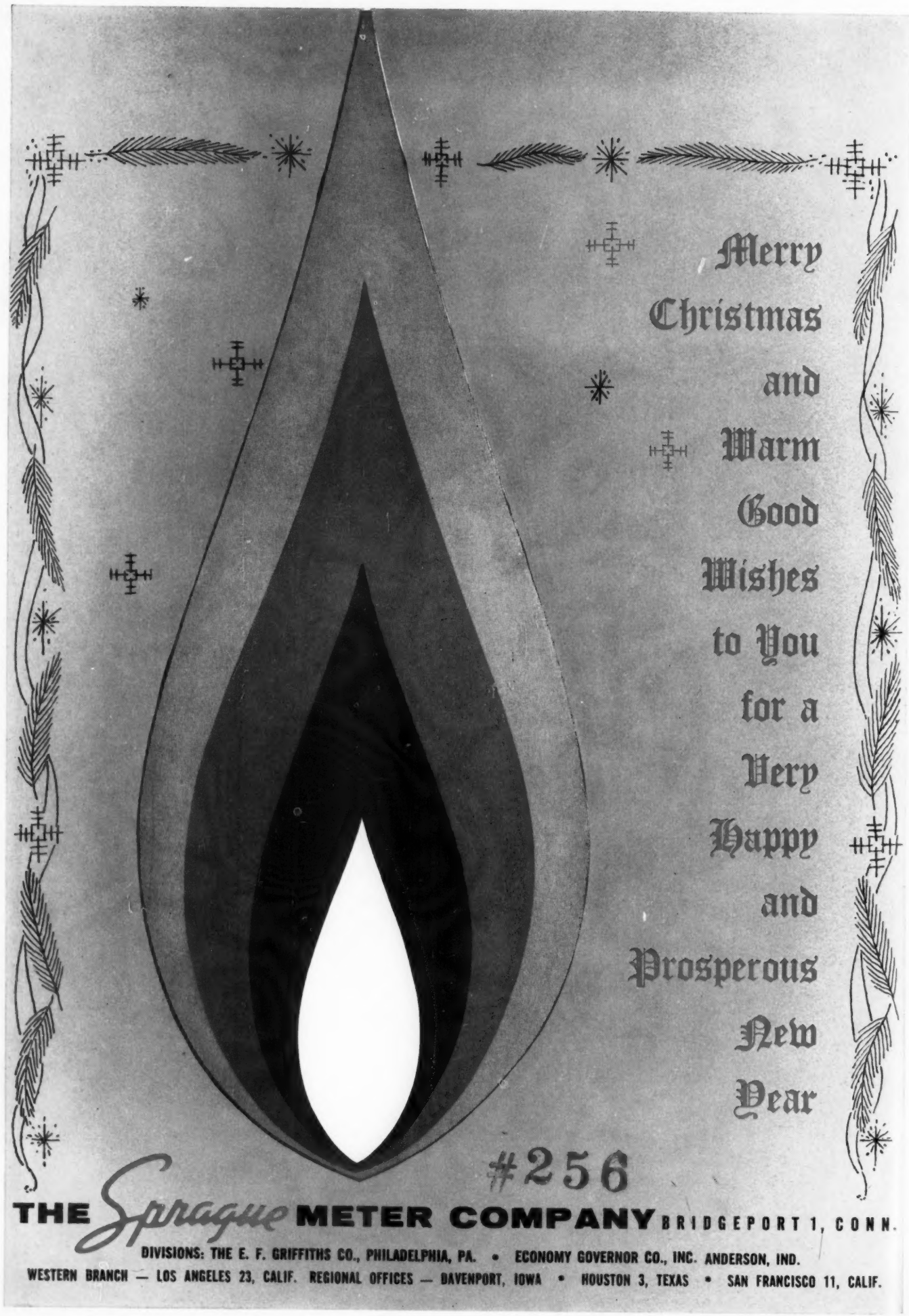
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for a
Very
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and
Prosperous
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